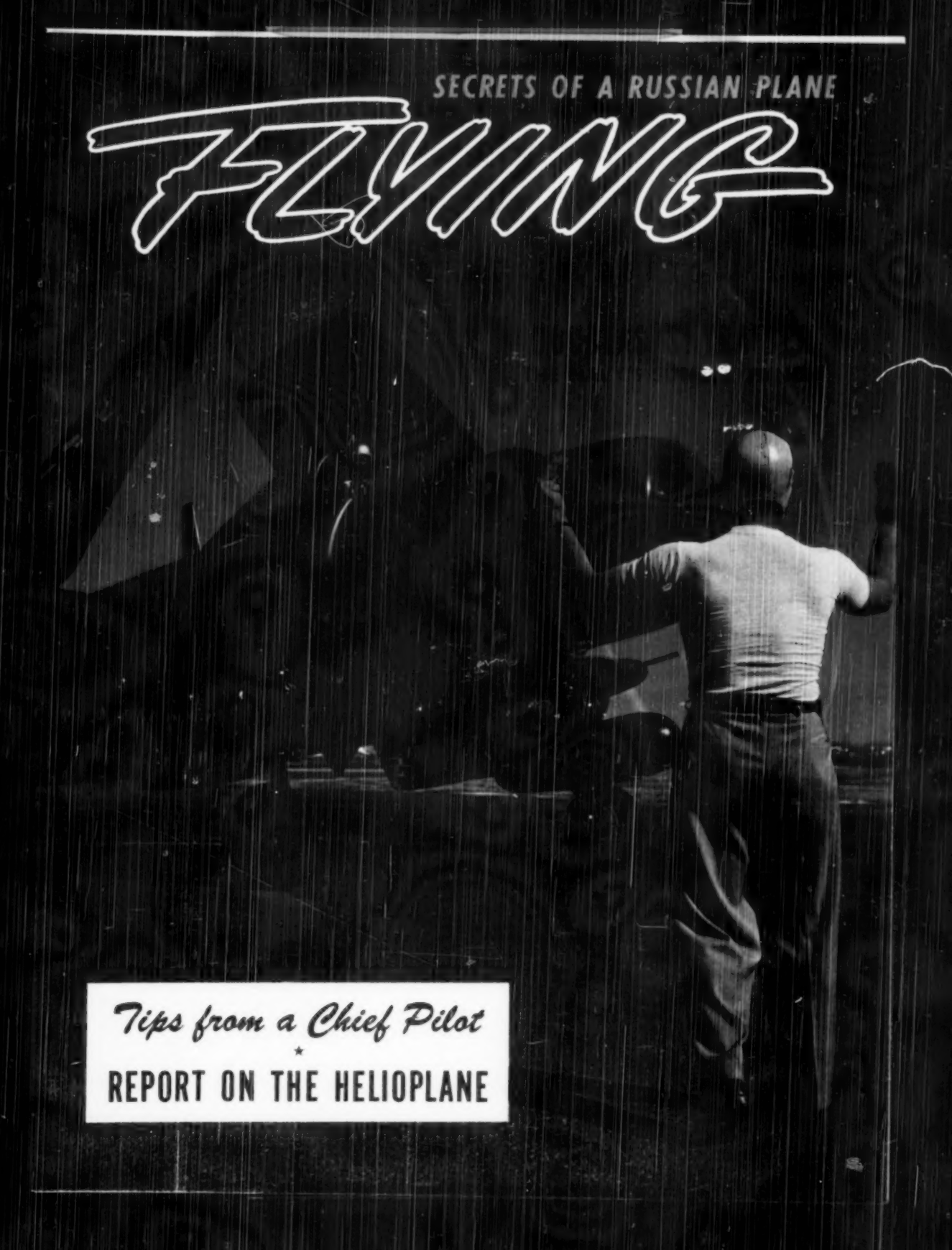
SECRETS OF A RUSSIAN PLANE

FLYING



Tips from a Chief Pilot

★

REPORT ON THE HELIOPLANE

One Step Ahead!

Pan American stratocruisers serviced in Miami

AIRCRAFT & ENGINE MECHANICS

An Urgent need exists for properly trained A & E Mechanics throughout commercial aviation. Our C.A.A. approved school with a quarter-century of experience assures your quickest advancement. Embry-Riddle students learn fast with modern equipment...working on live aircraft in airline-size hangars.

ENGINEERING

Embry-Riddle's Design Engineering and Maintenance Course offers you A & E certification eligibility plus basic engineering knowledge necessary to fill such positions as Field Service, Project or Maintenance Engineer.

A & E COMBINED * WITH COMMERCIAL PILOT

Airmen with dual pilot-engineering ability are needed by aviation companies and operators. Embry-Riddle combination training offers you the most in your aviation career.

*Not available to veterans, but combined courses may be taken consecutively with proper justification.

COMMERCIAL PILOT

Embry-Riddle trained pilots benefit from our years of experience with 30,000 students...the best instructors, up-to-date aircraft...superb year-'round flying weather...qualifications unexcelled anywhere. Instrument and instructor's ratings also available.

with EMBRY-RIDDLE *Training*

Never has there been such opportunity for you in commercial aviation. The demand for *properly trained* men far exceeds the supply.

Start your career now at Embry-Riddle, where thorough, down-to-earth training in today's aviation needs will put you one *step ahead* of the crowd. Train in Miami, terminal of a dozen major airlines. Live on Embry-Riddle's modern campus in sunny, southern Florida.

Embry-Riddle enjoys highest school approvals... close contacts with major aviation employers. This is your big chance. For full information fill in the coupon below and mail today!

Embry Riddle
International
SCHOOL OF AVIATION
MIAMI 30, FLORIDA

Dean of Enrollments - Dept. 94
Embry-Riddle School of Aviation
Miami 30, Florida

Please Print

NAME _____

ADDRESS _____

City _____

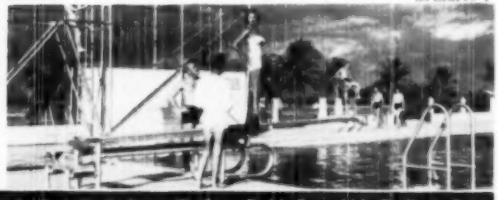
State _____ Age _____

I am interested in...

- ☐ A.&E. Mechanic
- ☐ Commercial Pilot
- ☐ Engineering
- ☐ A.&E. Combined with Commercial Pilot *
- ☐ Flying Mechanic *
- ☐ Drafting & Design

Check One ☐ Veteran ☐ Non-Veteran

SWIMMING POOL ON CAMPUS



TRAIN IN MIAMI — AIR CAPITAL OF THE WORLD

It's OK— we're landing on GCA

Gilfillan GCA Meets the Challenge — PAST...PRESENT...FUTURE

Gilfillan GCA has met the challenge of the air age. Its mastery over bad weather was dramatically proved by the Berlin Airlift. GCA received a large share of the credit for the success of Operation Vittles. ★ Today, GCA is on the job at 167 airports around the world. At GCAirports, schedules are regular, delays rare. ★ Gilfillan GCA—built with the *future* in mind—is the only navigational aid with the speed, accuracy and spacing safety features to cope with the supersonic problems of *tomorrow's* jet aircraft. ★ Air safety cannot wait. Gilfillan, in cooperation with the CAA, USAF and USN, is the prime factor in keeping air safety equipment in step with air travel.

GCA

Gilfillan
LOS ANGELES

Chairman of the Board
WILLIAM B. ZIFF

President
B. G. DAVIS

Secretary-Treasurer
ARTHUR T. PULLEN

Vice-Presidents
MICHAEL H. FROELICH
Director, Eastern Division

H. J. MORGANROTH
Production Director

H. G. STRONG
Circulation Director

Art Director
HERMAN R. BOLLIN

THE COVER: Navy's heavily-armed Douglas Skyraider is a lethal weapon. (See page 18.)

EDITORIAL

Publisher
WILLIAM B. ZIFF

Assistant Publisher
MICHAEL H. FROELICH

Editor
CURTIS FULLER

Managing Editor
CHARLES L. BLACK

Associate Editor
LYNN H. BLACK

Contributing Editors
HY SHERIDAN, Chicago
RICHARD SAUNDERS, Washington

Art Editor
LEW MERRELL

ADVERTISING

Eastern Advertising Manager
DOUGLAS A. ANDREWS

Midwestern Advertising Manager
WILLIAM M. SPRINGER

Western Advertising Manager
WILLIAM L. PINNEY

BRANCH OFFICES

NEW YORK (1)
Empire State Bldg., WI 7-0400

LOS ANGELES (14)
815 S. Hill St., TUcker 9215

FLYING

APRIL • 1950

MILITARY AVIATION

Secrets from a Russian Photo ..... Charles W. Cain 11
Douglas Skyraider—The Navy's Pedigreed Pulverizer ..... Gilbert C. Close 18
The AF Reserve Gets a Transfusion ..... William Welsh 31
Behind the Air Guard Controversy ..... Richard E. Saunders 32

CIVIL AVIATION

Report on the Helioplane ..... Charles L. Black 14
Notes from a Chief Pilot ..... Capt. Fred R. Bailey as compiled and annotated by Hy Sheridan 16
7,000 Miles by Seaplane ..... Peter M. Bowers 20
Britain Takes the Lead ..... William Green 24
FLYING's Check Pilot: The Schweizer 1-23 Sailplane ..... Paul B. MacCready, Jr. 28
Insurance for Flying Clubs ..... William H. Rodda 30

HUMOR

Airlift Laffs 26

ENGINEERING

What Makes Engines Tick? ..... Ralph Platt 22

DEPARTMENTS

Notes on Civil Flying 6
Military News 8
Report from Washington ..... Richard E. Saunders 32
Have You Seen? 33
I Learned About Flying from That! No. 25 ..... Pauline M. Dyer 36
AOPA News 38
The Mailbox 40
Logging Time with Hy Sheridan 42
Fifteen Years Ago 44
Betty Skelton's Notebook 46
Flat Spins ..... Harold Helfer 56
Photo Credits 59

SHORT FEATURES

Soviet All-Wing Glider ..... William Green 48
Coairdinator 52
A FLYING Tip: Practice Those Eights ..... Foster A. Lane 58

COPYRIGHT 1950
ZIFF-DAVIS PUBLISHING COMPANY
185 North Wabash Ave., Chicago 1, Ill.
Member of the Audit Bureau of Circulations
VOLUME 46 • NUMBER 4

FLYING is published monthly by Ziff-Davis Publishing Company at 185 N. Wabash Ave., Chicago 1, Ill. SUBSCRIPTION RATES: In U. S., Canada, Mexico, South and Central America and U. S. Possessions, $3.00 for twelve issues; in British Empire, $4.00; all other foreign countries, $4.00 for twelve issues. Subscribers should allow two weeks for the change of address. Address all subscription letters to the Director of Circulation, FLYING, 185 North Wabash Avenue, Chicago 1. Entered as second class matter, September 8, 1942, at the Post office, Chicago, Illinois, under the act of March 3, 1879. Entered as second class matter at the Post Office Department, Ottawa, Canada. Contributors should retain copy of contributions. All submitted material must contain return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for their safety. Accepted material is subject to whatever adaptations and revisions are necessary to meet requirements. Payment covers all authors', contributors' and contestants' rights, title and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

What every pilot knows...
No matter what plane he flies, every pilot knows the importance of the fuel that powers it.
Over the years Phillips 66 Aviation Gasoline and Phillips 66 Engine Oils have earned the preference of an increasing number of private owners. Flyers who make their choice on the basis of time-tested quality rely on Phillips 66 Aviation Products for dependable performance. The Aviation Department, Phillips Petroleum Company, Bartlesville, Oklahoma.
Phillips
66
AVIATION PRODUCTS

Simplified
ALL-WEATHER
OMNI-RANGE NAVIGATION
AVIGATOR
Precision Navigation

NEON INDICATING LAMP
Shows Accuracy of both Signal and Equipment at ALL Times. Requires no ugly hoods or shielding even in brightest sunlight. IT FAILS SAFE!

7 RADIOS IN ONE
VHF AVIGATOR

★ 6 Channel VHF Transmitter
★ Tunable Static Free VHF Receiver with Vernier Control
★ Range Band Receiver
★ Standard Broadcast Receiver
★ Directional Loop with Azimuth*
★ Marker Beacon Receiver*
★ Complete Omni-Range with Indicator

* Optional at slight additional cost

ONLY 3 LIGHTWEIGHT UNITS
Weighs only 22 pounds installed

NOW ONLY $635
Including taxes, Antenna and installation kit.

STATIC FREE LOW INSTALLATION—EASY TO INSTALL IN YOUR PRESENT PLANE

FOR A CONVINCING DEMONSTRATION SEE YOUR LOCAL DEALER TODAY!

Factory Sales Representative
DAVE RUMPH COMPANY
Fort Worth 6, Texas

DISTRIBUTED BY

Aircraft Radio Laboratories Chicago, Ill.	Aero Instruments, Inc. Wichita, Kansas
Vans Air Service St. Cloud, Minn.	Aircraft Radio Service Sandston, Va.
Nan-Bor Air Facilities Detroit (Flat Rock), Mich.	Red Bank Airport, Inc. Red Bank, N. J.
Carolina Aeronautics Hendersonville, N. C.	Shobe, Inc. Memphis, Tenn.

NOTES ON CIVIL FLYING

. . . **The Pentecost Hoppicopter** is by no means dead. All active work on the Hoppicopter in the United States was halted more than a year ago for lack of funds. Horace T. Pentecost went to England at the invitation and expense of the British Government. Hoppi-copters, Ltd., was organized in England and has been carrying on development. In this country, some former employees and associates of Pentecost have joined him and they are building an improved motorcycle-type helicopter which is expected to be flying this year.

. . . **Goodyear** Tire and Rubber Company will not continue its sponsorship of the 190 cubic inch class at the National Air Races in Cleveland this year. Goodyear Trophy Races were held in Cleveland in 1947, 1948, and 1949.

. . . **Meyers 145** (price $5,995) is improved two-placer over former Meyers 125. Sea level cruising speed is 145-155 m.p.h.; altitude cruising 162 m.p.h.; sea level landing speed 42 m.p.h. with full flaps. Plane is manufactured at Tecumseh, Mich., and builder guarantees claims within three per cent at full gross weight of plane.

. . . **TEMCO has abandoned** its plan for a 145-h.p. commercial Swift and will offer two versions of its 125-h.p. Swift in 1950. The Standard De Luxe is priced at $4,495 f.a.f. Dallas, and the Custom De Luxe at $5,150 f.a.f. Dallas. Both models include Aeromatic propellers and two-way radio.

. . . **The Fulton Airphibian** is expected to be certificated soon. It will be America's first flying automobile and the first ever to be put on public sale. Test units for the two-placer have already logged more than 200,000 flying and driving miles. Tooling and jigging is about 80 per cent complete and progressing rapidly. A distribution system is currently being set up. (See flight photograph of the Airphibian below.)

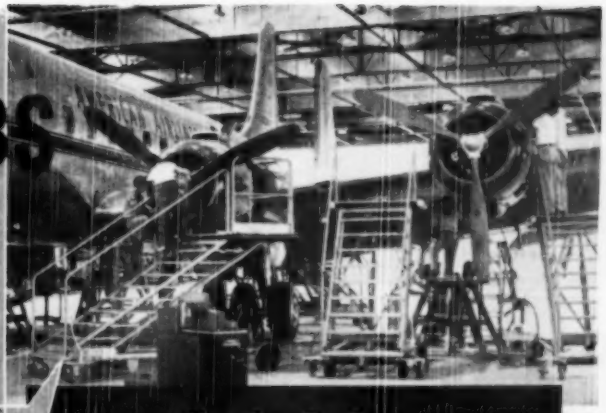
. . . **Rodney Jocelyn**, Langhorne, Pa., (right) won first prize in the Gulf Oil National Aerobatic Contest at the All-

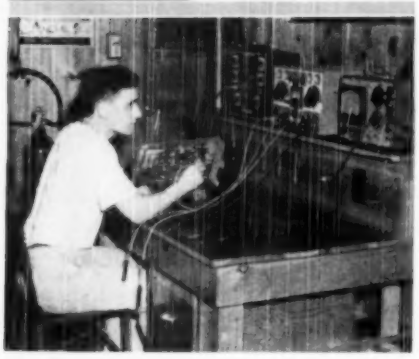
American Maneuvers in Miami in January. Beverly Howard, long-time champion, was second, and FLYING's own Betty Skelton was third. There was no woman's division, and Betty competed against men for the first time.

. . . **Piper has five** new models for 1950. The Super Cub 95 is powered by a Continental engine of 90 h.p.; the Super Cub 105 by a 108-h.p. Lycoming. The latter has flaps and balanced elevators, cruises at 105 m.p.h. and can be flown in controlled flight as slowly as 28 m.p.h. In addition to these there are three versions of the Piper Pacer which is the new name for the Clipper. Fuel capacity has been increased to a total of 36 gallons in two wing tanks. There is a softer landing gear. The Pacer 115 is powered by the 108-h.p. Lycoming; the Pacer 125 and 135 by a 125-h.p. Lycoming. The latter has an Aeromatic prop.

. . . **Lear, Inc.**, has announced a new remotely controlled VHF receiver with a small cockpit tuning control unit available for aircraft owners who require flexible mounting arrangements.

ONE OF THESE JOBS CAN BE *Yours-*





You Can Be On a MAJOR INDUSTRY PAYROLL in 2 Years or less.

You can train at Spartan for one of these good-paying jobs that require skilled hands. Many Spartan graduates are now successful in aviation. Study and training is the solution. You can follow in their footsteps. Thousands of new employees are needed in aviation — men with training to build, fly and service the speedier, more powerful and longer-range aircraft. The only limit to your progress in aviation is lack of training and skill.

Spartan, the University of Aviation, can provide the training that will prepare you for a successful career in aviation. Spartan has the shops, the aircraft and equipment, and industry-trained instructors. Your progress is entirely dependent upon your ability to absorb instruction. You train on "live" aircraft. You study exploded assemblies, cut-away models, training films and diagrams that enable you to gain most knowledge in the least possible time. *You'll not need MORE than SPARTAN training, you cannot afford to take LESS!*

Airlines, manufacturers and airport operators call on Spartan for graduates from this internationally-famous school. The demand is greater than the supply. Get your training NOW — there will be a job for you.

The coupon will bring complete information. Mark and mail now for FREE CATALOG and AVIATION CAREER STUDIES showing opportunities and earning possibilities.

SPARTAN
A UNIVERSITY OF AVIATION
SCHOOL of AERONAUTICS — MAXWELL W. BALFOUR, DIRECTOR
COLLEGE of ENGINEERING — ADDRESS DEPT. F-40
TULSA, OKLAHOMA

Maxwell W. Balfour, Director
Spartan School of Aeronautics Dept. F-40
Tulsa, Oklahoma

Please send your free Catalog immediately.

Name_____ Age____

Address_____

City_____ State_____

Indicate which of these branches interests you:

☐ Flight ☐ Instruments ☐ Flight Engineer
☐ Mechanics ☐ Aeronautical Engineering
☐ Radio ☐ Airline Maintenance Engineering
☐ Meteorology ☐ Management and Operations

Spartan is approved for training under the G. I. Bill of Rights

Operation "EFFICIENCY"

EST. 1928 PAC PACIFIC AIRMOTIVE CORP. Burbank, Calif. PAA

WE'RE KNOWN BY THE COMPANY WE KEEP!

Pan American . . . *the world's most experienced airline* demands dependability in all phases of its operations. That's why PAA chose Pacific Airmotive to serve its far-flung empire . . . an association of 15 years duration.

This is indeed proud company! When PAA . . . *world's most experienced airline* combines with PAC . . . *world's most experienced Engine Overhaul & Supply House* . . . the net result — "OPERATION EFFICIENCY"

PAC

PACIFIC AIRMOTIVE CORP.

Burbank, California

OTHER MAJOR DIVISIONS

LINDEN, N. J. • KANSAS CITY, KANS.

OAKLAND • SEATTLE • ANCHORAGE

MILITARY NEWS

. . . **Capt. Chuck Yeager,** who first flew faster than sound in January, 1949, is now test pilot on the delta-winged Convair XF-92. The plane is being checked at Muroc Dry Lake, Calif.

. . . **By end of 1951,** the Air Force expects to have three B-36 Wings fully equipped and another B-36 Wing partially equipped with the giant intercontinental bombers.

. . . **World-wide** aircraft accident rate in the Air Force was the lowest in 1949 for any year since 1921, when complete records were first kept.

. . . **Willy Messerschmitt,** noted German plane designer, is working on a new fighter for Hindustan. It will be ready for flight tests this summer.

. . . **Military aircraft** production in the U.S. in 1949 was about 28,000,000 pounds. That's less than half the figure recommended by the Congressional Air Policy Commission.

. . . **Economy cuts** in flying time of Air National Guardsmen may cause deaths of 12 to 16 ANG pilots before June 30, says Maj. Gen. E. A. Walsh, president of the National Guard Association. His contention is based on cutbacks which reduce combat pilots in ANG to 110 flying hours and non-combat pilots to 80 hours annually.

. . . **Eighty to 85 per cent** of accidents in military air operations are due to carelessness or lack of knowledge of the effects of altitude on flying personnel, according to Brig. Gen. Otis O. Benson, Jr., commandant of the Air Force School of Aviation Medicine.

. . . **Lockheed F-94B,** two-seat all-weather fighter, will be powered by a Pratt & Whitney J-48 jet engine instead of the F-94's present J-33.

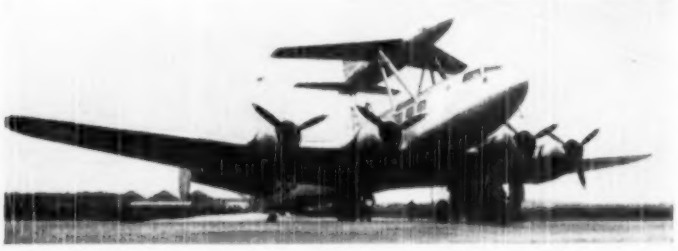
. . . **Marine Air Reserve** squadrons from Michigan and Florida have been selected as the nation's best Leatherneck reserve outfits for 1949. Top fighter squadron is Squadron 142, based at Miami. Best ground control intercept organization is Squadron 19, based at Detroit.

. . . **A Texas Congressman,** Paul Kilday, says that Air Force Secretary Symington assured him that the Air Force's proposed academy will be located at Randolph Field, Tex., if it is authorized by Congress. The Air Force, however, has announced that no definite site has been selected. The Air Force Academy Site Selection Board estimates that about 9,000 acres will be needed for the new service school.

. . . **Canada's first** turbojet engine, the Orenda, will produce about 5,000 pounds thrust and will power the Avro CF-100

twin-jet fighter which made its maiden flight recently. The engine is a post-war Canadian development built for the RCAF by Avro, Canada.

. . . **Some 30** prototype aircraft have flown in France since January 1, 1949.



Model of French SO-4000, twin turbojet bomber, is mounted above Languedoc for tests.

The Birdmen's Perch

Famous last words: "I won't stall out, I've got too much air speed!"

You won't hear a crack like that from Air Force or Navy trained flyers, because they know you *can* stall at high speeds.

But—there are still plenty of lightplane pilots who figure that the phenomenon is restricted to high-speed planes.

Actually, you can hit a high-speed stall in any plane. This maneuver is seldom demonstrated in civilian flying because it's plenty rough on both plane and pilot.

Always remember: at a given air speed, you can curve the flight path of a given plane only so sharply. Try to exceed your plane's limitations and—tut-tut, such a promising pilot, too!

AND NOW . . .

Leave us have a moment of silence for those embattled pilots who haven't yet discovered the wonders of Gulfpride Aviation Oil—Series D!

Listen—you can hear the laborings of their tired engines on the way to overhauls.

What a pity some pilots don't know that Gulfpride Aviation Oil—Series D—is the world's finest detergent dispersant oil for horizontally opposed engines. It's the only aviation oil put through Gulf's exclusive Alchlor Process to remove extra carbon and sludge formers.

How sad these same pilots don't realize that Gulfpride Aviation Oil—Series D—could increase their periods between overhauls up to 100%!

Pass the crying towel, Maggie.

LITTLE KNOWN FACTS DEPT.

Ah—but there's good news at LaGuardia tonight! If the lights burn a little later than usual, if a few scheduled flights fail to materialize, blame it all on A. P. Magner, Asst. Chief Dispatcher for Pan Am.

For his L.K.F. (with proof, mind you), this august personage has earned the most honorable Commission of Perch Pilot (br)—"bottom rung," that is.

Now, A. P., if you'll just forget your ecstasy for a minute and come down from the chandelier, we'll make with your L.K.F.A.W.K.P. (For youse guys what

can read: Little Known Facts About Well Known Planes.)

"Due to fuel consumption, the Boeing Stratocruiser loses weight in flight at a rate equal to one adult passenger disembarking every 3 minutes."

Your Commission is en route, A. P., trot out the gilt-edge frame.

Hey, you, the guy weeping in his beer . . .

Don't remain unsung forever. Send your Little Known Facts About Well Known Planes—with PROOF—to this address:

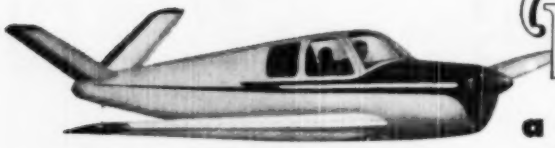
GULF AVIATION DEPT., GULF BUILDING
PITTSBURGH 30, PA.

Gulf Oil Corporation . . . Gulf Refining Company . . . Marketers of

GULF AVIATION PRODUCTS

WHEN FUEL RUNS LOW, DON'T JUST HOPE YOU HAVE ENOUGH LEFT•••
SMACK!
BECAUSE GAUGES SOMETIMES LIE•••
SPUTT!
AND YOU MIGHT BE EMBARRASSED BY AN ACUTE SHORTAGE OF•••
BYE NOW
THAT SUPER-POWERFUL GULF AVIATION GASOLINE!
GULF

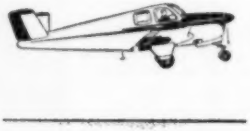
Features like these make this NEW



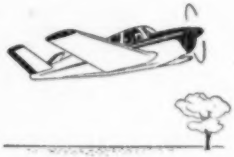
Beechcraft

a better buy than ever!

New Beechcraft propeller



Increased take-off horsepower



Faster-action landing gear

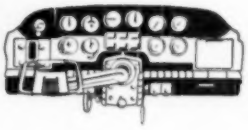
Increased, faster flap travel

New upholstery combinations

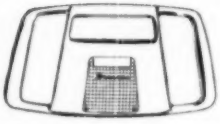
Three new map pockets

Four new arm rests

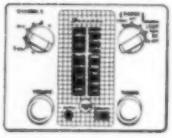
New exterior paint design



New instrument panel design



Safety-type control wheel



New radio with VHF channels

Access door for oil tank

It has no equal in performance, speed, economy, strength, safety, style and comfort!

The new B35 Beechcraft Bonanza exceeds all promises for a speed-with-economy plane that's roomy, comfortable and easy to fly! New performance features at moderate horsepower add to its versatility and safety, hold operating and maintenance costs at a *business economy* level! New operating conveniences and luxury appointments plus scores of refinements call for a personal inspection because there's room here to show only a few. See it! Get all the facts! You'll agree this greater-than-ever Beechcraft Bonanza is a better-than-ever value!

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles
Fuel economy, 9.5 gph

Get all the facts! There are hundreds more — about the extra advantages of the new Model B35 Beechcraft Bonanza. Check with your nearest Beechcraft distributor or dealer, or write for complete information on your company letterhead to Beech Aircraft Corporation, Wichita, Kansas.

Beechcraft BONANZA

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

FLYING
VOLUME 46, NUMBER 4
APRIL, 1950

Secrets FROM A RUSSIAN PHOTO

Lavochkin LA-11 crash-landed in Sweden last year. From this night flash photo, Expert Cain learned many secrets of Red military craft.

By CHARLES W. CAIN
Formerly Editor, The Aeroplane Spotter

What does this photo mean to you? It is filled with clues to Soviet plane design.

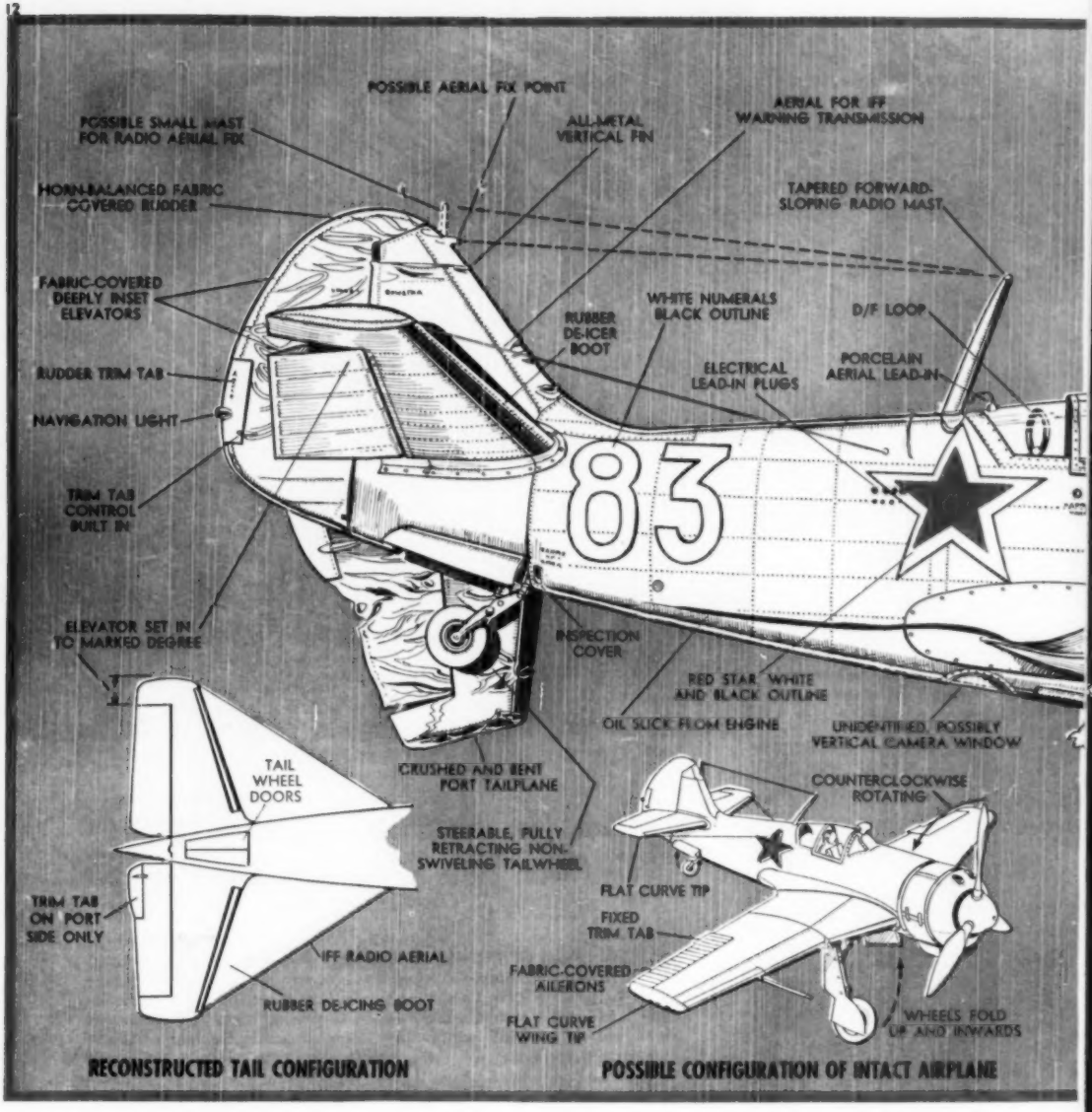
IN THE LATE EVENING last May 18, a fleeing Soviet lieutenant of the Russian Air Force crashed an unknown piston-engined fighter at a small air force base near Stockholm, Sweden. He thought he had landed in Norway, which wasn't surprising since his navigation had been by landfall and a large slice of luck. He had carefully hoarded extra gasoline for more than a year in order to make the flight, and had flown up from the south of Russia, using for a reference map a tiny reproduction of Europe which was attached to his diary.

He was fleeing the Soviets, he said, because the secret police had arrested his wife. The Soviet Embassy in Sweden tried hard to bully the Swedes into returning the "reactionary" pilot but they remained stubborn, and the pilot is believed to have been allowed to enter the United States. The plane itself was speedily returned to the Russians.

Because the plane crashed at the base of Södertörns Flygflottilj Nr. F 18 (Soedertoerns Flying Wing Number 18) at Tullinge near the metropolis, photographers were soon on the scene armed with interpreters. The fighter was identified as the Lavochkin LA-11. (Among the photographs taken is that reproduced above.)

Eyewitnesses said the airport was small and had only one narrow

Turn page to see what author found ——▶



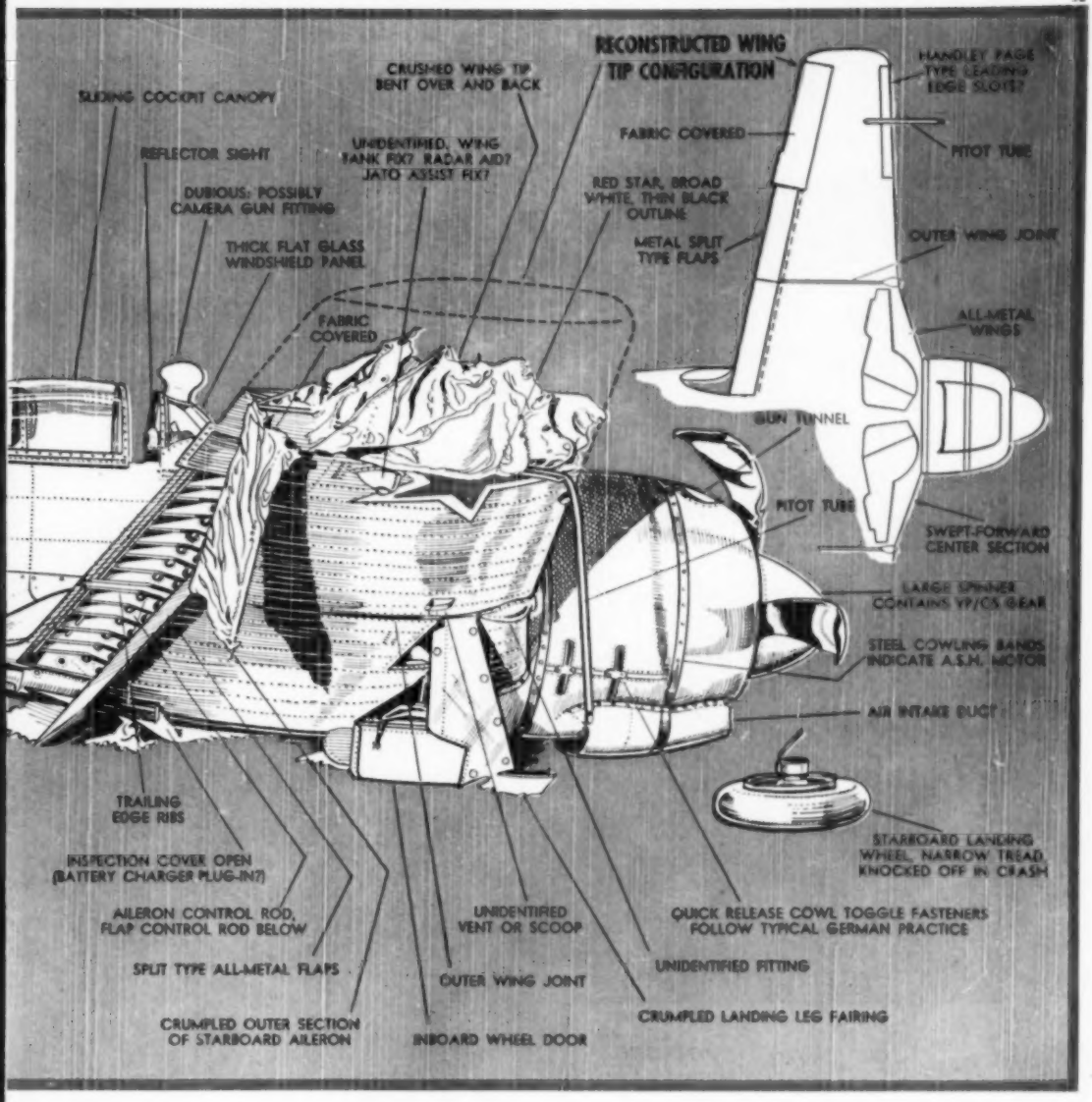
DRAWING EMPHASIZES DETAILS OF CRASHED SOVIET FIGHTER

Douglas Rolfe's drawing here is based upon a night photograph of the LA-11 plus the author's rough drawing made solely from a study of the photo. Except for the engine information, which came from Swedish sources, Mr. Cain has written this article entirely from his study of the photograph plus general information he already had on Soviet airplanes. It is a typical military-type intelligence analysis, and shows just how much information the most minor clues can supply.

runway. As the plane landed it skidded, tore off the left wing near the root, slewed around, caught the left tailplane and rudder, collapsed the left landing gear, ripped off the right wheel, and crushed the outer right wing.

Seeking further information, the editors of FLYING commissioned the author to do a military-type intelligence job on the plane, based upon the single photograph available plus what the author already knew about it. During the past war the author was called upon to examine photographic evidence of new planes from all the battlefronts.

The accompanying photograph of the LA-11 provides a bonanza of information. From this one unretouched photograph, a passable three-view drawing could be turned


RECONSTRUCTED WING TIP CONFIGURATION
SLIDING COCKPIT CANOPY
REFLECTOR SIGHT
DUBIOUS: POSSIBLY CAMERA GUN FITTING
THICK FLAT GLASS WINDSHIELD PANEL
FABRIC COVERED
CRUSHED WING TIP BENT OVER AND BACK
UNIDENTIFIED. WING TANK FIX? RADAR AID? JATO ASSIST FIX?
RED STAR, BROAD WHITE, THIN BLACK OUTLINE
METAL SPLIT TYPE FLAPS
HANDLEY PAGE TYPE LEADING EDGE SLOTS?
FABRIC COVERED
PITOT TUBE
OUTER WING JOINT
ALL-METAL WINGS
GUN TUNNEL
PITOT TUBE
SWEPT-FORWARD CENTER SECTION
LARGE SPINNER CONTAINS VP/CS GEAR
STEEL COWLING BANDS INDICATE A.S.H. MOTOR
AIR INTAKE DUCT
STARBOARD LANDING WHEEL, NARROW TREAD, KNOCKED OFF IN CRASH
TRAILING EDGE RIBS
INSPECTION COVER OPEN (BATTERY CHARGER PLUG-IN?)
AILERON CONTROL ROD, FLAP CONTROL ROD BELOW
SPLIT TYPE ALL-METAL FLAPS
CRUMPLED OUTER SECTION OF STARBOARD AILERON
UNIDENTIFIED VENT OR SCOOP
OUTER WING JOINT
INBOARD WHEEL DOOR
QUICK RELEASE COWL TOGGLE FASTENERS FOLLOW TYPICAL GERMAN PRACTICE
UNIDENTIFIED FITTING
CRUMPLED LANDING LEG FAIRING

out. The drawing reproduced here was made by Douglas Rolfe based upon the photograph and a sketch by the author. It shows a great deal of what can be noted on the photo but by no means all.

How good a spy are you? What else can you see on the photo which is not on the drawing?

To anticipate queries, I would add the following:

The powerplant is designed by Arkadi Dmitr'evich Shv'etsov (see page 16, November, 1949, FLYING). Swedish sources have confirmed this fact. Further evidence points to it being a 14-cylinder ASh-82 twin-row air-cooled radial driving a three-bladed metal propeller turning counter-clockwise (note direction of bending in photograph).

The LA-11 is claimed to be a high altitude fighter with light loading with a powerful engine for its size. It has been rumored that two ramjet units can be mounted, one under each wing, to increase the speed by 52 m.p.h. for short bursts of intercepter speed. Normal maximum speed with the 1,850-h.p. ASh-82 is about 400 m.p.h.

Thus, with a good rate of turn and light loading acrobatic abilities, the LA-11 would be a powerful adversary, even in these days of super jets, although its armament by western standards may be considered a trifle light.

Of course, the Russian Air Force also possesses fast heavily armed jet aircraft. They are in squadron service in quantity. Though it is not (Continued on page 57)

Football field take-off at M.I.T. shows aeronautical engineers and students that craft can use small part of gridiron for airport. The plane started in front of crowd before goal posts in left background. By time it passed over photographers on 50-yard line, the *Helioplane* had gained a considerable amount of altitude. At this point, say observers, the plane is climbing under full control, is not mushing.

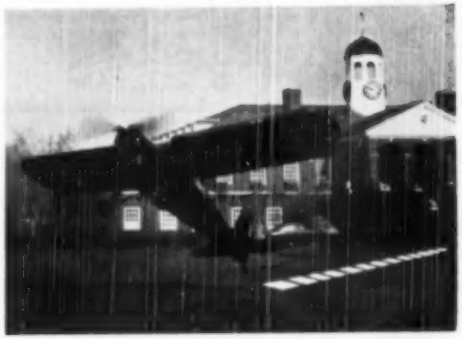
Report on the Helioplane

By CHARLES L. BLACK
Managing Editor of FLYING

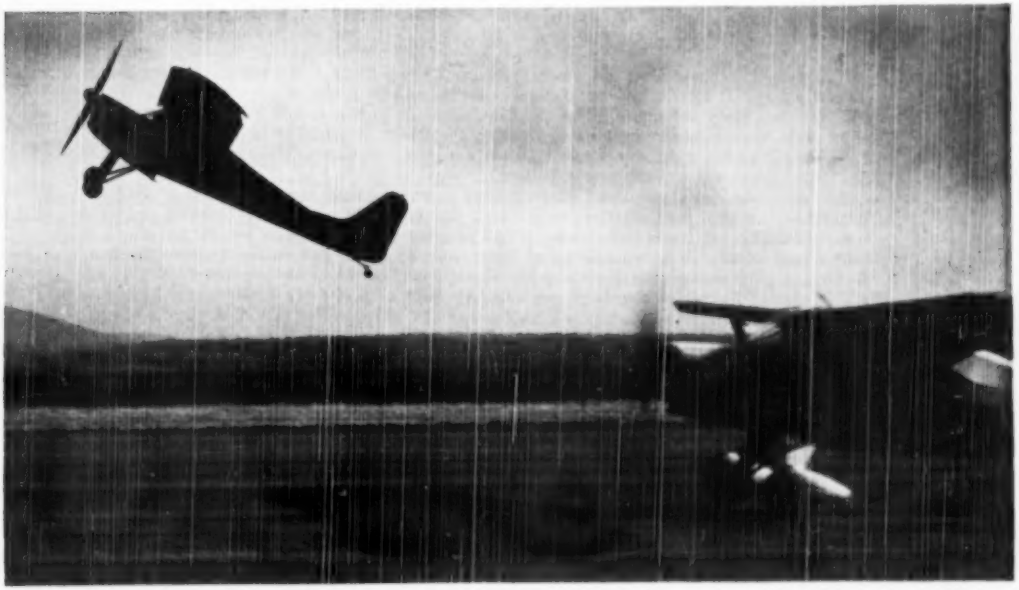
A FOUR-PLACE *Helioplane* will be certificated and built in limited quantities in 1950, but none will be available to the general public. In announcing their plans for market-testing the airplane before releasing it generally, Helio Corporation officials have announced an agreement with Aeronca Aircraft Corporation whereby that company will manufacture the planes under contract. An initial quantity of 100 will be produced this year if certification can be accomplished by mid-summer.

First of the 100 planes should roll off the production lines about September 1, according to Helio Corporation's chairman, Lynn Bollinger, a Harvard professor.

U.S. lightplane pilots have been waiting for this announcement since the summer of 1949, when a two-place version of the *Helioplane* was first exhibited. [See "Is This the 'Revolutionary' Lightplane?," June 1949, FLYING.] Witnessed flights of the two-placer at that time showed it capable of taking off and landing in a tennis court, slow-flying under full control at speeds verging on 27 m.p.h., and cruising at about 108 m.p.h. on an 85-h.p. engine. The *Helioplane's* amazing performance was attributed by its designer, Prof. Otto Koppen of M.I.T., (*Continued on page 60*)



Tail leaves ground last on *Helioplane* take-off. Demonstration at Harvard University shows two-place version of plane can use lawn for airstrip. Take-off run started in front of door (see dotted line). Helio officials say ground clearance of the large propeller is not critical because nose lifts immediately when the throttle is opened.



Remarkable performance of experimental *Helioplane* is indicated by take-off race against conventional lightplane. Photo was taken 150 feet down runway. Conventional craft has excellent take-off performance by today's standards, but it required 200 feet more to get off ground. The two planes have same wing area. Gas loads were equal but *Helioplane* had 30 less horsepower and pilot was heavier.

Notes FROM A Chief Pilot...

Captain Bailey

By CAPT. FRED R. BAILEY

AS COMPILED AND ANNOTATED BY HY SHERIDAN

ALL of us like the inside dope, the low-down, the real McCoy. We are all Peeping Toms, but we call it intellectual curiosity so that we can be proud of it.

Unconsciously we know that what people say in public is not quite the truth, it is what they unconsciously want us to think is the truth. It seems to be a fairly safe topic, though, to wonder what the inside truth is about airline pilots, presumably expert, who are to aviation what cherubs are to heaven.

Do these men make mistakes? What do they have to watch out for and be careful of? What does the chief pilot tell them in private? Would you like to know? Curiosity may not have skinned a cat, but it has skinned a hell of a lot of mink, I notice.

The bulk of this story is made up of items shucked out of *Tips on the Airline Pilot Profession*, a periodic mimeographed paper written confidentially by our chief pilot to his airline flyers. There are also such comments by your modest reporter as he thinks he can get away with. In the following paragraphs they are preceded by the mystic symbol ●.

Chief Pilot Fred Bailey of American Airlines is a most unusual fellow. For one thing, he has been able to keep his pilots reasonably contented. *Tips* is a good deal more than just being what the chief pilot wishes to tell his men; it is also the collection of the experiences, usually the uncomfortable ones, of the several airline pilots.

Chief Pilot Bailey, based in Chicago, has a gift of getting hold of such experiences. Although he does not go along with Mae West, who asserts that to err is often divine, he knows very well that it is human. A pilot who makes an ass out of himself does not hesitate to go to Fred Bailey and tell him about it, and usually Bailey will come back with a similar one on himself.

Fred is the only man who has won the President's safety trophy twice! Because of Fred Bailey's ability to inspire confidence, his deep insight into both men and situations, and his common sense and deft wit, the Bailey *Tips* should be a mother lode.

—HY SHERIDAN

First Officer Landings

The total experience gained throughout the company during our safety program with respect to First Officer landings has developed the following policies which have been adopted:

1. Newly promoted captains to make all take-offs and landings for at least the first three months.
2. Captains with less than one year's experience as such will not allow first officers to fly from the left seat.
3. First officer landings in general should be continued but with the strict understanding that the sole responsibility rests with the captain.

● If the First Officer should luck through the operation of the law of averages, of course, a twinkle-toe landing, you can smile at the passengers yourself. They won't know who did it.

Pilot Comfort

Request has been made to the engineering department to place suitable water-proof material in the cockpit to place over the laps of both pilots when the windshields begin to leak. This request is from the wives who have been pressing the trousers.

● Somehow or other a brave man would rather appear before his passengers with dry pants.

Airways Traffic

Flight 26-67 of October 21, 1945, on solid instruments, missed a DC-3 near Lafayette, Ind., by 25 feet! Our ship was on the right side of the beam. This is only a reminder to check and double-check—and ride the correct side of the range.

Altimeters

Washington ceiling 500 feet; the pilot set the No. 1 altimeter 1,000 feet in error. A good way to transfer flying status to under "Chief Pilot, St. Peter."

● Fatigue is just as toxic as alcohol.

First Year Captains

A clearance does not mean that you have to fly. Tape weather is not always accurate; watch the trend and if in your opinion the flight should not fly, use your best judgment and cancel.

Altimeters

Thumb Rule for cold weather. Figure your altimeter 10 per cent off on the danger side. That is, at 10,000 feet in real cold air your actual altitude is 9,000 feet. One of our captains over Elkins recently in CAVU weather with cold air was actually below the hill tops when his altimeter was showing 6,000 feet and the highest terrain was 4,700 feet. . . . Give yourself plenty of latitude, especially in cold weather.

● Plenty of latitude in matters of altitude is indeed a good rule. Don't forget altimeter lag when you are coming down blind, for the oil on the bearings gets gummy when it is cold or oxidized or both.

Gnat's Eyebrow Approaches

With a 5,000-foot runway, some pilots clear the obstructions on the landing approach by a gnat's eyebrow. During the past few years I can recall four accidents attributed to this type of approach.

● In other words, don't be gnats.

Approach Under Low Ceilings

With due consideration to crosswind component, a straight-in approach is frequently better than having to circle an airport under low ceiling.

● That goes for low visibility, too. You get cockeyed quick when trying to keep the airport in sight and watch where you are going too.

Flashlights

Two good flashlights in the cockpit on night operation is a necessity.

Oil Temperatures

If the oil temperature runs high, try a richer mixture; it may help. Too rich is better than too lean.

Intuition

A lot of pilots have developed a high degree of intuition. "Intuition is given only to him who has undergone long preparation to receive it."

Thunderstorms

In turbulent air keep in mind three things:

1. Severe turbulence calls for extra terrain clearance.
2. A 180° turn is a smart maneuver; a good run is better than a poor stand.
3. The company has never criticized a pilot for turning around on account of rough air.

Fire Extinguisher

Pyrene, when heated, makes phosgene gas. In one case a first officer and several passengers ended up in the hospital due to phosgene poisonous gas. This happened to another operator.

● Phosgene is so poisonous that it was used in World War I as a weapon.

Last-Minute Check

Always use the cockpit check-list. Then, as you open the throttles, check the elevator trim tabs, mixture controls, gas tank selectors, and move the controls.

● This only costs a second, and may save you 30 years.

DC-3 Single-Engine Overshoot

A pilot tried to go around with flaps down; cracked up a half mile from the airport. They won't fly on one engine with full flaps.

● With so many airline pilots, we can think of everything. Law of averages.

Windmilling Prop

A windmilling prop costs you 15-16 m.p.h. at 3,500 feet.

Ramp Taxiing

For congested ramp taxiing, the turtle technique is recommended: Slow and easy with the head out.

Cold Weather Landing Approaches

Keep 'em warm; a cold engine is like a barking dog—lots of noise and no bite.

Fire Drill

● Lots of us get to thinking that we are too good to make a bad mistake. Perhaps the most dangerous condition to be encountered in flying is a long safety record, either for an individual pilot or a big company. Look at the following item, which is some kind of a record. It shows what haste can do for us, and to us.

DC-3 fire on the ground. Man in the cockpit pulled the fuel dump valve instead of the fire extinguisher. Complete loss. A periodic fire drill is always in order—check your crew today.

Hot Weather

Slow take-offs and fast landings call for long runways; use 'em.

(Continued on page 48)

DOUGLAS SKYRAIDER

The Navy's Pedigreed Pulverizer

Big carrier-borne AD's have more than 20 major duties with U.S. Navy.

By GILBERT C. CLOSE

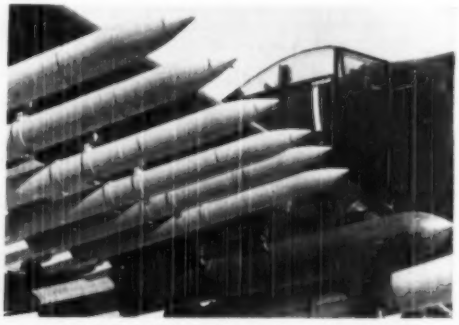
THE DOUGLAS AD (*Skyraider*) is the tool that has lifted the broadside from the battleship Navy's deck into the skies, and has increased its range of effectiveness from 16 miles to 750 miles. Besides this not inconsiderable ability the *Skyraider* has more than 20 other important duties, some of which are guarded by security.

Navy airmen boast that the *Skyraider* can carry up to 10,000 pounds of rockets and bombs. It can deliver an explosive punch equal to the broadside of a light cruiser. It can dive bomb, toss bomb and launch torpedoes. With a radome on its belly that makes it look like a kangaroo with triplets, it can go upstairs and act as the eyes of the fleet, seeking out enemy targets more than 100 miles beyond the horizon. The best the ship-based radar can do is about 30 miles.

The AD can be used for chemical warfare, for laying mines, and for ground support of troops. With radar packages on its bomb racks, it can be used for counter-measures work and for night attack. With a packaged cable reel replacing a bomb, it serves for target towing. Remove a hatch cover, put in a camera bracket, and you've got a photographic airplane. Hang auxiliary fuel tanks where the bombs should be, and you can take off from a carrier in the Pacific and land on a carrier in the Atlantic. And besides, it's in the 400-m.p.h. speed class. About here the Navy airmen button their lips and get that "security" look in their eyes.

The first *Skyraider* (then known as the Douglas XBT2D attack bomber) was flown March 18, 1945. Douglas test pilot La Verne Browne, once the "John Trent" of the spine-tingling "Tailspin Tommy" movie series, reports laconically on

Douglas Skyraider takes off with load of HVAR rockets. One of biggest planes to operate from carriers, the AD has gross weight of 26,000 pounds.



Lethal power is lugged externally on the *Skyraider*. Here are five HVAR rockets, *Tiny Tim*, and a torpedo.

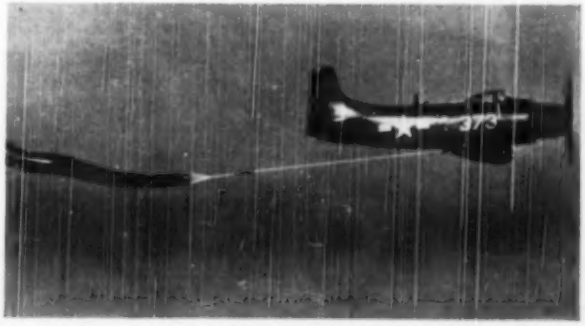
Skyraider lugs 12 HVAR rockets plus two *Tiny Tims*, can carry 6,000 pounds of armament. Note the AD's unusual fuselage dive brakes.

that first flight. "I wish I could tell of some dramatic incident that occurred. There wasn't any. I just floated around up there for an hour and a half and brought her down. But I did do something that's unprecedented, I believe, for a first trip. The airplane handled so well that I put it through rolls and Immelmanns to check it for maneuverability."

The AD has a pedigree dating back to 1935 when the first Douglas dive bomber, the XBT-1, was built. During the ten-year interim Douglas built 16 successive dive bomber models.

But the last step forward resulting (*Continued on page 55*)

Bulging shell is plastic radome housing powerful radar that can spot enemy ships 100 miles beyond the horizon.



Versatility is key to *Skyraider's* success. Here it serves as target tow, replacing special-purpose planes. More than 22 versions of AD have been built.

Bill Walker, left, and author with Luscombe in which they made flight. Route obscured by photo included stops at Coeur D'Alene, Polson, Fort Benton, Fort Peck, Bismarck.

7000 Miles by Seaplane

By PETER M. BOWERS

FLYING A SEAPLANE from coast to coast, though rare enough, has been accomplished a number of times. But Bill Walker, a fellow pilot, and I are the first, we believe, to actually circle the country in a seaplane. Starting at Seattle, in an 85-h.p. Luscombe 8E equipped with Edo floats, we covered over 7,000 miles in a flight across the northern part of the country, down the East Coast, along the Gulf Coast and across the southern deserts, then up the West Coast to home. We crossed 26 states and the District of Columbia in a two-week vacation involving 90 hours of flight.

During the entire flight we had only minor trouble, and over certain parts of the country we actually felt safer in a seaplane than we would have in a landplane. As planned, none of our hops was to have been over 300 miles long, and all but one of them could have been halved or even quartered because of the presence of suitable bodies of water on which to land. However, revisions en route combined (*Continued on page* 51)

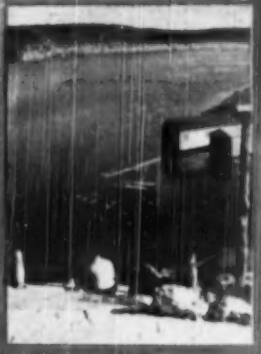
Pete Bowers, 31, is Boeing engineer, well-known aviation photographer.

Only mishap (no damage) occurred when plane got stuck on a Missouri river sandbar.

WATER LANDINGS ANYWHERE

Seaplanes have unexplored utility, as proved again by the trip around the country described in this article. Route could have been planned with water landings only 50 to 100 miles apart.

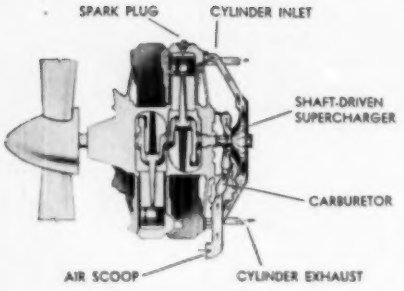
Over San Francisco Bay Bridge on homeward trek, the seaplane hunts for a base. Travelers were disappointed to find water landing facilities scarce along West Coast. The Bay area has only three bases of any consequence.



On Lake Manteo, Nitro, N.C., seaplane is moored to two floating buoys and overhead steel cable.

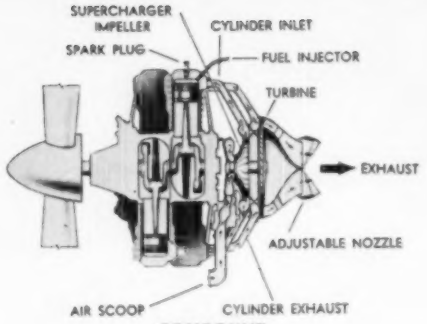
FARGO
ST. PAUL
MILWAUKEE
CHICAGO
CINCINNATI
FAIRMONT
BALTIMORE
ELIZABETH CITY
MANTEO
WILMINGTON
FERNANDINA
JACKSONVILLE
MOBILE
NEW ORLEANS
LAGOON
GALVESTON

Legend
O— STOPS ENROUTE
•— ADJACENT CITIES



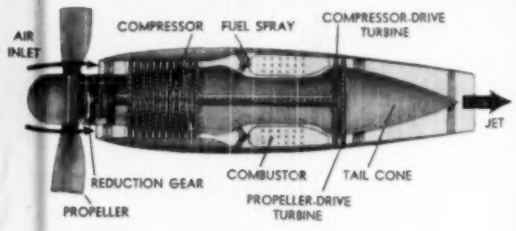
RECIPROCATING

Air is compressed in supercharger after entering at air scoop. It is then forced into cylinder where it is further compressed before ignition. Heated by burning fuel, expanding air pushes piston before escaping as exhaust. Fuel (metered into air in correct proportion by carburetor) can be injected in carburetor, supercharger, intake manifold or cylinder itself. Supercharger increases "breathing" capacity of engine at all altitudes and maintains suitable intake pressures at high altitude. Power for supercharger is derived from the engine crankshaft.



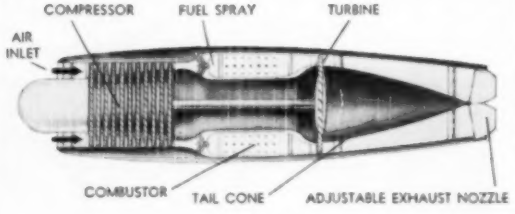
COMPOUND

In the compound engine, air leaves the cylinders at slightly higher pressure than in the simple reciprocating engine. It drives a turbine which, in turn, drives the supercharger. In the compound engine, waste heat of exhaust gases is used more efficiently in driving the supercharger. Advantages are that the crankshaft is relieved of responsibility to supply supercharger power, and the amount of supercharging can be varied for different requirements. In some cases, excess power from the turbine is fed back to crankshaft to increase the horsepower.



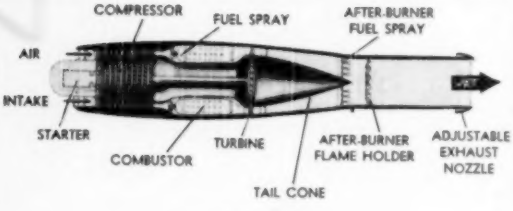
TURBOPROP

Air is compressed in successive stages after being drawn or rammed into compressor inlet. It is then discharged at high pressure into a combustor where fuel is injected and burned. Hot gases are expanded through turbine to drive (1) the compressor and (2) the propeller, which gives most of the propulsive thrust. Remaining energy (less than 25 per cent) is converted into jet thrust. Turboprop engine uses more fuel than reciprocating but can do more work for given frontal area and weight. It is continuous flow and almost vibrationless.



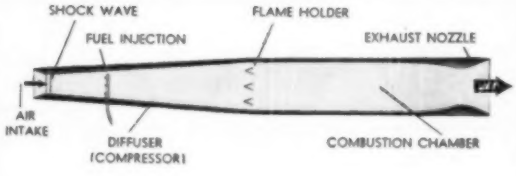
TURBOJET

Instead of taking energy from a hot gas stream to drive a prop (as does the turboprop), the gas turbine jet engine converts the energy through an exhaust nozzle directly into propulsive thrust. Control of thrust is accomplished mainly by regulating fuel supply, but reaction is sluggish at altitude. In cases where quick acceleration is needed, it has been found better to also use an adjustable exhaust nozzle which can control jet thrust quickly while the turbine is kept at constant r.p.m. As is the turboprop, the turbojet is compact and lightweight.



TURBO-RAMJET

Basically, this is a turbojet with means of re-heating the exhaust gases before exhausting them from the jet nozzle. The re-heater is sometimes called an "afterburner." Temperature limitations on turbine blades permit only about one-fourth of incoming air to burn with fuel. By increasing engine length and injecting more fuel downstream of the turbine, remaining oxygen can be burned with no hazard to highly stressed working parts. Fuel consumption is high but as much as 60 per cent more thrust can be provided at take-off by an afterburner.



RAMJET

Simplest form of "flying stovepipe" consists of a compressor burner and expansion nozzle. Incoming air is slowed down in a special inlet, resulting in compression. Since compression varies approximately as the square of the speed at which air is rammed into the engine, the ramjet will not work at low flight speeds. At less than about 400 m.p.h., thrust will not exceed drag. Ramjet is used for high speed flight, however, because the faster the speed, the greater the ram compression. A maximum amount of fuel can be burned in each pound of air.

What Makes Engines Tick?

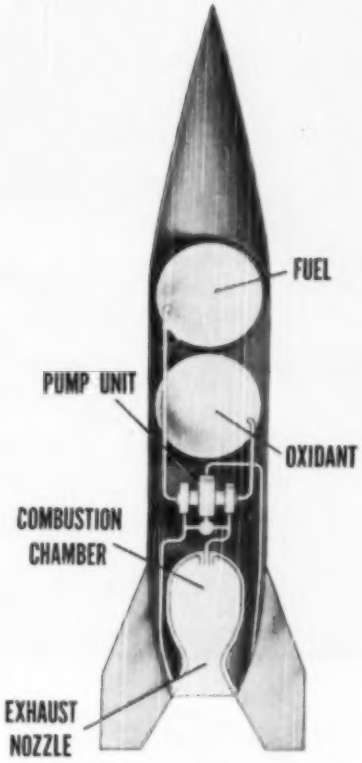
By RALPH PLATT
Aviation Editor, Cleveland (O.) News

RECENTLY, a friend volunteered to explain the differences between a conventional and a jet engine. "One has a propeller and makes a lot of noise," he said. "The other emits a stream of hot gases which pushes the plane through the air with a whoosh. It's as simple as that."

This same character probably would have defined women as "blondes, brunettes and redheads"—and would have appended, "that's all you need to know."

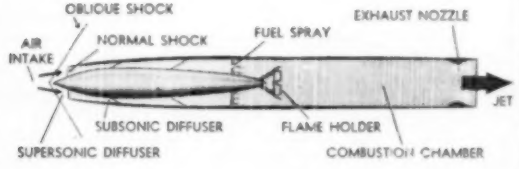
Unfortunately, it's not as simple as that. All engines, like all women, have much in common. But their internal principles and operating functions can vary tremendously. And to understand jets and conventional engines—just as blondes, brunettes and redheads—you must be familiar with the principles which motivate them and the factors which limit their utilization.

To furnish some of the facts of life on engines, FLYING asked experts at NACA's Lewis Flight Propulsion Laboratory at Cleveland to supply the easily-understood sketches and explanations on these pages. END



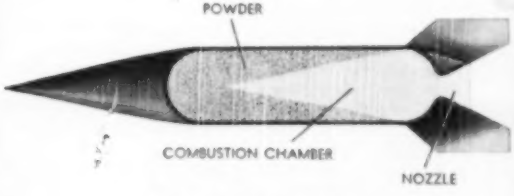
LIQUID FUEL ROCKET

For long-range, out-of-the-earth's-atmosphere flight, or for very high bursts of speed, a liquid fuel rocket gives the highest rate of energy release of any combustion engine. A small portion of liquid propellent is burned and the hot gases are used to drive turbine pumps for injecting the oxidant and fuel separately into a combustion chamber. There, they are burned at a high temperature and create the high pressures which provide jet thrust. Different combinations of fuels and oxidants provide temperatures ranging from 3,500° to 10,000°.



RAMJET WITH SUPERSONIC DIFFUSER

For very high supersonic speeds, ram compression efficiency can be greatly increased by adding a special inlet that slows down the air outside the engine and decelerates it from sonic speed at the inlet to low sub-sonic speed at the flame-holder. The design above incorporates a central body useful for storage of fuel or instruments without increasing frontal area and without hurting the "breathing" capacity of the engine. Ramjets are lighter and simpler than other engines. They have poor fuel economy but economy increases with the speed.



SOLID FUEL ROCKET

This is the simplest of all engines—requiring merely a combustion chamber where fuel and oxidant are stored, a nozzle for converting pressure energy to thrust, and a simple igniter. No control of thrust is possible, and once ignited the rocket will fire until fuel is exhausted. Weight of a solid fuel rocket is high because entire fuel container must withstand maximum pressures and temperatures reached during combustion. Solid fuel rocket is useful for short-range guided missiles and has been used in jet assisted take-off devices.

Armstrong Whitworth Apollo

New jet transports give Britain big advantage in future world markets.

Britain Takes the Lead

By WILLIAM GREEN

WHEN YOU step into the Vickers *Viscount*, one of Britain's several new turboprop transports, you are due for a surprise. Never before have you flown in an airplane as quiet and as vibration free as this one.

The four *Darts* come to life with a low hum, reminiscent of a generating plant in a power station. The hum gradually increases as the pilot advances the throttles. In line waiting for take-off, you can hear conventional aircraft in front making their run-up.

The *Viscount's* tricycle gear gives you a smooth take-off run. The transport unsticks smartly and climbs steeply. After levelling off you have little doubt that the *Viscount* is one of the quietest planes ever flown. Cockpit noise is not as subdued as you had been led to expect, but it is certainly low in the main cabin. Normal conversations can be carried on at a distance of several feet.

The *Viscount's* quietness is certain to reduce flight fatigue of both passengers and crew. Vickers say that compared with the reciprocating-engine-powered *Viking*, the noise level has been reduced by 20 decibels in the low frequency ranges and 10 decibels in the high ranges. This is equivalent to eliminating 99 per cent of all external noise energy.

One passenger said that the low noise level in the plane had "fascinated and awed him." Vibration in its accepted form just doesn't exist in the *Viscount*. It is possible to stand a pencil on its flat end, or balance a coin on edge for 10 to 20 minutes at a stretch in this airplane.

The *Viscount* is only one of several production-model turboprop transports, in addition to the four-jet de Havilland *Comet*, which Great Britain is developing for world transport markets in the 1950's. Britain is far in advance of any other country in the adaptation of the jet engine and the closely related turboprop engine to transport aircraft. Besides these models designed from the beginning for the new power plants, Britain has spent several years gaining experience with jet and turboprop conversions of more conventional airplanes.

By contrast, the United States has no jet conversions of any existing transport planes and so far as is known does not even have on its drafting boards a craft designed from the beginning to take advantage of the new power.

It has been a long-range gamble for Britain. She is still feeling the effects of not being ready with good transports at the end of the war. But it has been to the markets of the 1950's that her eyes have been turned.

Vickers Viscount

Handley Page Hermes 5

Handley Page Marathon 2

However, the planned break into world markets, and particu'arly into the American home market, will not prove a walkover. Even though, for once, currency is in Britain's favor, these new aircraft which incorporate a miscellany of new devices can be expected to suffer from setbacks and teething troubles during the months and years ahead. The problems of commercial turbine flight are so new and so great that it would be the height of complacency to expect trouble-free development from inaugural flight to airline delivery.

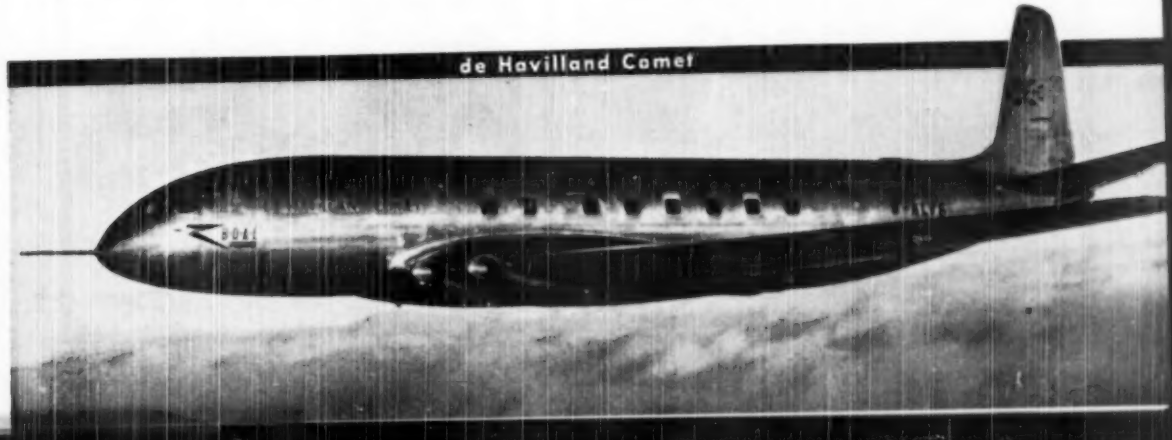
The advantages of turbine-powered transports are as obvious as the problems to be solved in their operation. The gas turbine is incomparably simpler than the piston engine. It is lighter and more durable and offers a better ratio between power and weight.

Maintenance hours on developed turbines are only some 25 per cent of those needed for piston engines. They need no warming-up period prior to take-off; it's simply a case of switch on and go! Absence of vibration justifies the assumption that airframe and equipment maintenance, overhaul and replacement will be greatly reduced. Instrument replacements in particular will be but a fraction of that of piston-engined aircraft. The use of cheaper and less volatile fuel reduces the fire hazard, and both crew and passenger fatigue will be reduced by the lower noise level and lack of vibration.

Britain's "jet" transports are predominantly turboprop-powered, the sole exception being the de Havilland *Comet*. Few aircraft have ever achieved such widespread attention or given rise to more discussion than this airplane.

There is nothing radical in the design of the *Comet*. Its contours, although unusually clean, show nothing revolutionary and the builders emphasize that its wing loading is moderate and that speed has not been obtained by the sacrifice of slow-flying ability.

Originally conceived for use over non-stop long-distance routes, the *Comet* has since proved itself "economically competitive" on (*Continued on page 44*)



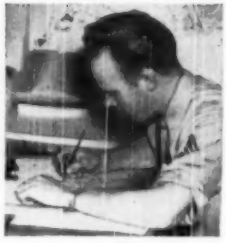
de Havilland Comet

AIRLIFT LAFFS

It all started when the sergeant ribbed the colonel.

THE CARTOONS on these pages were drawn by T/Sgt. John H. "Jake" Schuffert to help keep up morale during the Berlin Airlift. They were so popular that the *Air Force Times* published a booklet of them, and Maj. Gen. William H. Tunner said: "Schuffert's cartoons were good for at least one laugh each day to thousands of men who were struggling with dirty planes and difficult living conditions."

Schuffert says, "I was born in Homestead, Pa., on December 18, same day as Betty Grable (but that is where the similarity ends) in the year 1920. I 'jined up' on November 27, 1941. Took flying cadet exam. No soap, color blind. Went to radio school, gunnery school, and the mess hall three times a day. Went overseas with the 464th Bomb Group. Decorated the group planes with cartoons, women, etc. Went out of business when crews learned every plane I painted was lost in action.

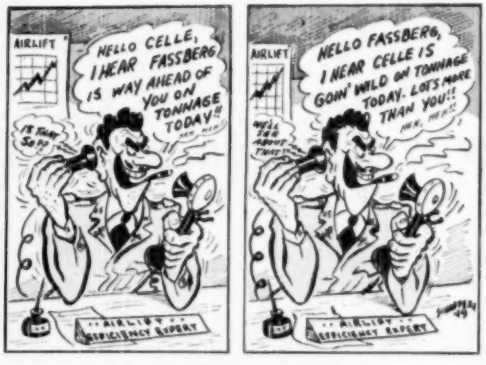


Sergeant Schuffert

"Completed tour with a short stay in Yugoslavia. Ferried planes to New Guinea. After I re-enlisted I was assigned the dull job of flying to Paris and back twice a month. One day I saw a staff officer, Col. Theodore R. Milton, crawl out of the plane sack arrayed in socks, shorts, and disheveled hair. I immediately recorded this scene in cartoon form. Colonel Milton had me transferred to headquarters so they could keep an eye on me. So I was assigned to General Tunner's crew as radio operator and thence to the Airlift.

"Had fate been kinder, I would not be amongst you now, plaguing you with these moronic cartoons."

. . . AIRLIFT INTRIGUE . . .


AIRLIFT
HELLO CELLE, I HEAR FASSBERG IS WAY AHEAD OF YOU ON TONNAGE TODAY!!
AIRLIFT
HELLO FASSBERG, I HEAR CELLE IS GOIN' WILD ON TONNAGE TODAY. LOTS MORE THAN YOU!!

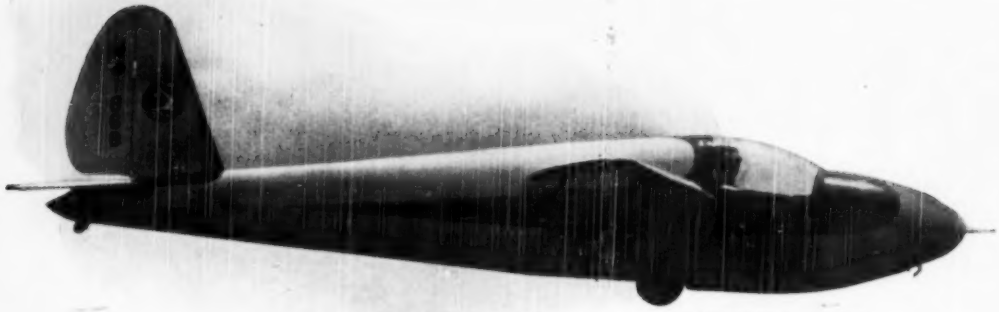
Or: How Records Are Broken

"Will you please repeat your last transmission?"

"If the mud gets any worse, we'll have to get a new 'taxi' strip."

"Don't pay any attention to him. He's always showing off."

"THIS is my office, stupid!!"



Streamlined sailplane sells for $2,195 at factory.

THE *Schweizer 1-23 Sailplane*

By PAUL B. MacCREADY, Jr.

Only 24, the author is one of the nation's most experienced glider pilots. In 1947, he set an international record with a 2:0 mile goal and return flight. In 1948 and 1949 he was winner of the National Soaring Contests.

EVEN IN THE dim light of daybreak at Grand Prairie, Tex., some of the features of the deluxe Schweizer 1-23 sailplane were apparent. It was easy to move out of the hangar—its span is only about 44 feet, it has a main wheel and tail wheel instead of skids, and it weighs only 358 pounds empty.

Out in the sunlight, the 1-23's principal characteristics become obvious: it is streamlined and simple with no extra pieces of "drag" hanging out in the airstream. The smooth, moulded canopy of the all-metal sailplane combines excellent visibility with hardly a change of curvature where it joins the fuselage in front. Since sailplanes often get to altitudes at which temperatures are extremely low, the Lucite is mounted in its metal frame in such a way that it can expand and contract without breaking.

In spite of the 1-23's low weight, it has a design load factor of 8.34, and is actually much stronger than that. To get the best up-currents, soaring pilots sometimes fly in turbulence a lightplane pilot would avoid.

Design speed is 123 m.p.h., placard 110 m.p.h. Aspect ratio is about 13, since a longer and thinner wing would increase both weight and price.

First on the agenda the morning I flew the Schweizer 1-23 (owned by E. J. Reeves, president of the Soaring Society of America) was a performance test to determine rate of sink at each airspeed. From these tests, I plotted the performance curve which is shown on page 60.

(Performance curves tell the sailplane pilot at a glance what a powerplane pilot gets from listings of stalling speed, cruising speed, maximum speed, take-off and landing distances, and maximum ceiling. The curve works at all altitudes, for at any certain indicated airspeed the ratio of sinking speed to forward speed is always the same.)

The performance curve of the 1-23 shows the minimum sinking rate is 2.3 feet per second—low for a sailplane. It stalls around 33 m.p.h., which makes landing very simple and permits tight turns in thermals while the sailplane banks only slightly. The best gliding ratio is about 25:1—25 feet forward for every foot down. For example, from 5,280 feet the pilot of the 1-23 can pick a landing field from an area of almost 2,000 square miles! Little wonder soaring is safe!

First thing you notice as you get in a 1-23 is the roominess of the cockpit—unusual for a glider. The light blue upholstery of Reeves' deluxe 1-23 is pleasing to the eye, and the soft cushions pleasing to other parts. The seat is wide, has arm rests and an adjustable back slope, and the rudder pedals also can be adjusted. No matter how you are built, you will fit the 1-23.

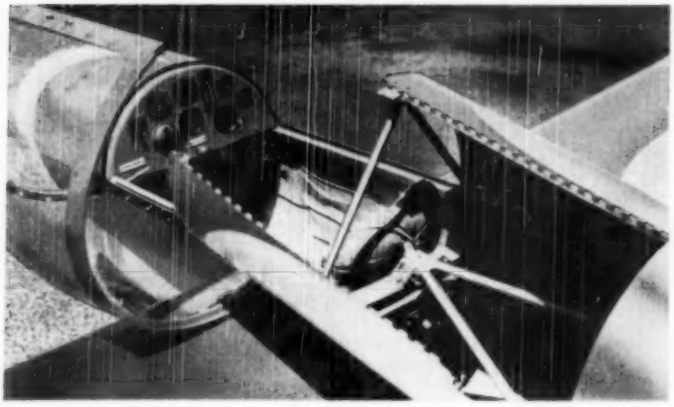
At 9 a.m., after the thermals were cooking properly, I climbed into the cockpit and pulled down the Lucite canopy. It fastened easily from the inside. On most Schweizer sailplanes, including the 1-23, the tow release is operated by a round red knob, and the spoiler and brake by a dark "T" handle. It is hard to get mixed up but even if you do, pulling the wrong handle is not dangerous.

Take-off was conventional. Climbing, in high-tow position 300 feet behind and 30 feet above the towplane and its slipstream, it was impossible to watch the towplane over the nose of the glider. However, the slightest turn enabled me to keep the towplane in sight. Over-all visibility is excellent.

We towed up through the low (*Continued on page 60*)

All-metal I-23 has 44-foot span, weighs 358 pounds empty. Design speed is 123 m.p.h. Inset, a partially opened spoiler, viewed from rear of the wing.

Roomy cockpit is unusual for glider. Wide seat has arm rests and an adjustable back slope. Instruments include an electric turn-bank indicator.



FLYING's CHECK PILOT

EDITOR'S NOTE

This series of articles is planned to help the pilot and prospective plane owner evaluate aircraft now on the market. Only aircraft holding a CAA Type Certificate are flown. The authors evaluate each aircraft through the eyes of the average private pilot who flies an airplane for business or recreation.

Insurance For Flying Clubs . . .

By WILLIAM H. RODDA

Secretary, Transportation Rating Bureau

What policies should a club carry? How much will they cost? What coverage do they give?

WHAT WILL IT COST?

Approximate annual premiums of typical flying club with five members, owning one two-place trainer valued at $2,000.

Type of Coverage	Limits	Annual Premium
Bodily injury or death to persons not passengers in the aircraft.	$50,000 for one person; $100,000 for any one accident.	$42.00
Passenger liability, injury or death to passenger in the aircraft.	$25,000 for one passenger seat.	$85.00
Property damage to property of others.	$25,000	$36.00
Hull insurance, "all risks" coverage while on the ground and in flight. Deductible or participation applying to flight losses.	Value of plane	$320.00

Rates quoted are typical. Rates vary between companies and also vary according to age of aircraft, original value and whether it is regularly hangared. Flying clubs which own several planes may be able to secure better rates on a fleet basis.

IF YOU belong to a flying club, you should know whether the club carries insurance. If it doesn't, you should do something about it.

All members of unincorporated flying clubs may be held personally liable for damages awarded by a court against the club—regardless of who was responsible for the accident. On the other hand, individuals belonging to incorporated clubs do not have the same responsibility. Damages awarded against an incorporated organization are payable out of the corporation's assets.

Aircraft accidents may cause four types of loss to flying clubs: (1) liability for death or injury to the public, (2) liability for death or injury to passengers, (3) liability for damage to property not belonging to the club, and (4) damage to the club's planes.

With an insurance policy, the premium of which can be budgeted along with other regular expenses, the club is relieved from the possibility of standing a large loss.

Greatest chance of a large loss is from causing personal injury to the public. People have been trapped in dwellings set afire by plane crashes. Spectators have been struck by planes at airports. In Tennessee a couple of years ago, a pilot made a forced landing in a farmer's field. The farmer, helping to start the engine, was seriously injured by the spinning propeller. These instances are unusual and occur infrequently; but because of large damages often awarded in cases of this type, public liability cannot be overlooked.

A public liability policy gives the most important coverage. It provides that the insurance company will pay up to the limits of the policy the amount of any liability which the club may incur as a result of injury or death to members of the public. "Members of the public" include anyone who is not a club member or who is not a passenger in the plane at the time of the accident. Limits of at least $50,000 for any one person and $100,000 for all persons involved in any one accident are recommended for flying clubs.

Passenger liability insurance should also be carried by most flying clubs, except in cases where a club plane is used exclusively for training purposes or only by members for maintaining proficiency in their flying. If passengers are carried rarely or not at all, the club membership may feel that passenger liability insurance is unnecessary. In many flying clubs, however, the club plane is used by members for weekend and cross-country trips with passengers riding as guests of the pilot. All such clubs should carry passenger liability insurance. Any accident to the passenger may result in the club's being held liable for the injuries, especially if the accident results from motor failure or any cause in which plane maintenance may be a factor. Insurance of at least $25,000 per passenger seat is recommended.

Property damage insurance for a flying club covers its liability for damage to property of others as a result of the operation of the airplane. Airplanes can do extensive damage to property, especially if a crash should set fire to a building. A coverage of at least $25,000 is recommended for this type of insurance.

Most flying clubs also carry hull insurance to reimburse the club in case of damage to its plane. The flying club is in a different position from a private owner who either flies his plane himself or carefully picks the pilots who fly for him. The very nature of a flying club makes it difficult to attain the same degree of supervision that a private owner can use. Numerous persons fly the club plane. Ownership is divided, and there is likely to be some feeling that "what is everybody's business is nobody's business." Each mem- (Continued on page 62)

After a period of post-war doldrums, the Air Force's civilian arm makes a comeback.

The AF Reserve GETS A TRANSFUSION

Working with regulars, reservists at Otis AFB practice loading F-80 machine guns at a sighting range. These men belong to a so-called "corollary unit," which gets to use equipment assigned to a regular Air Force outfit. Other reserve organizations, however, still are equipped with obsolescent aircraft like the Douglas B-26 (top photo).

By WILLIAM WELSH

A NEW APPROACH to the age-old problem of how to equip reserve outfits with the same modern equipment used by regular forces has been instituted by the Air Force. Results to date mean stronger U. S. air power.

Until June, 1949, the Air Force was training its reserve officers and airmen in mediocre fashion. Separated from regular AF units, except by occasional geographic proximity, the flying personnel among the 38,000 members of the organized reserve (April, 1949) had to maintain proficiency by using some 74 light bomber type aircraft and 1,380 trainers.

Today, however, flying personnel among the 42,500 members of the organized reserve (January, 1950) are using not only the reserve 94 light bombers, 330 transport planes and 860 trainers, but—through the new corollary program—are training with the latest regular AF equipment, including jets and B-36's.

The "new" reserve is a distinct contrast to the Air Force-civilian organization of the period immediately following World War II. Faced first with a fight for its autonomy and then with the need of reorganizing once autonomy was attained, the Air Force devoted little time to its reserve forces.

Unlike the Air National Guard and the Naval Air Reserve, the AF group floundered along. The only planes available initially were primary and basic trainers, AT-6's and C-45's, and not too many of those. Until late 1948, members of organized units received no pay for their drill periods. Only a few of them were able to get any training duty.

In the fall of 1948, however, the (Continued on page 54)

REPORT FROM
WASHINGTON

A major policy conflict lies ahead.

It's the Air Force versus National Guard Bureau.

Behind the Air Guard Controversy

By RICHARD E. SAUNDERS

Washington Editor of FLYING

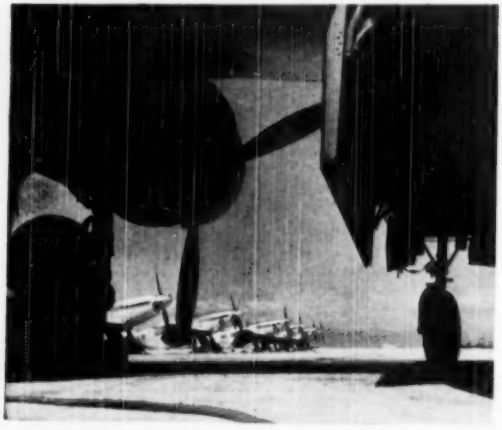
THE CURRENT CONTROVERSY between the Air Force and National Guard Bureau cannot be long ignored. It concerns the explosive but pertinent question of whether the traditional National Guard set-up under state control gives the country the trigger-quick defense team it needs under present conditions.

Atomic attack can come with devastating swiftness. It is courting disaster to assume there would be time for leisurely mobilization to ward off an initial blow and strike back with an effective counter-thrust.

If the Department of Defense can come up with the right answers—and make them stick—the squabble over the relationship between the National Guard Bureau and the Air National Guard may soon be settled. But this is only a preliminary skirmish that will do no more than clear the field for the major policy conflict that undoubtedly lies ahead.

The immediate rumpus was raised when Maj. Gen. Kennith F. Cramer, chief of the National Guard Bureau, attempted to oust the Air Force officer who served as his deputy for the Air National Guard. They clashed over procedure. Cramer insisted that Air Force liaison with the Air National Guard should be through him. The deputy, Maj. Gen. George C. Finch, thought differently. Finch believed that with the Air Force now running its own shop, he should be able to establish direct relations with the Air Guard. He believed that clearance through Cramer was a mere formality.

Secretaries Symington of the Air Force and Gray of the Army had to step in and try to straighten things out. They first made Cramer back down on the question of firing his air deputy. Then they decided to have Air Force and Army inspectors look over the Bureau's creaky machinery to see if adjustments were necessary. It was obvious that the advent of a separate Air Force had put an extra strain on the gears.



Air Guard planes include F-51's (above) and B-26's. The state air arms also have five F-80 squadrons and several F-84 outfits.

Bureau Created in 1916

At the time the Bureau was created back in 1916, military aviation was still a dubious experiment. Despite the fact that the pioneer Defense Act of 1916 could not anticipate the dominant role air power was destined to play, the measure was an important step in shaping national defense policy. For the first time, a real effort was made to make the National Guard organization an effective reserve force.

The Guard got substantial Federal aid in the form of modern equipment and training funds. The new-born Bureau was given the function of prescribing standards and exercising general supervision over the Federal aid program. It could not tell the states what to do but it could lay down conditions that had to be met in staging field maneuvers with Federal funds and in using equipment donated by the War Department.

There are strong hints that the major recommendation growing out of the investigation of the Bureau will be a proposal for a separate Air Guard Bureau. The study has been completed and the report is in the hands of top Pentagon officials. Symington and company undoubtedly would be delighted to have a separate Air Guard Bureau. It would be a move toward greater Air Force control over the Air Guard.

Will Congress Balk at Change?

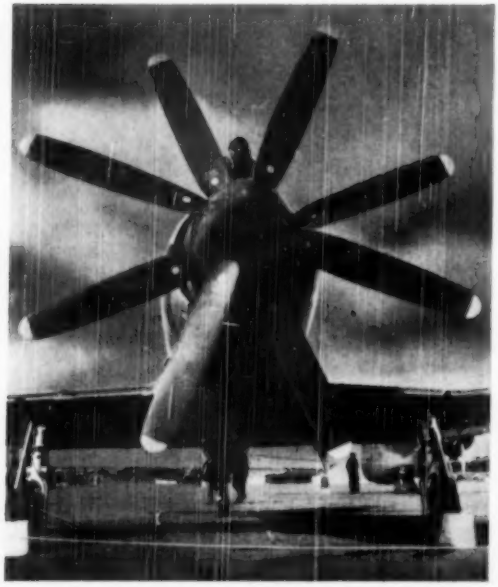
But it is one thing to advocate a separate Air Guard Bureau and quite another to carry out the proposal. Those who have delved into the legal aspects of the situation doubt that either the Department of Defense or the White House has the power to take such a step on its own. This means that Congress will have to be brought into the picture. Many believe that it will balk at the idea.

If some of the associations in the National Guard field decide their interests are threatened—as well they might—they could be counted on to do an effective blocking job. Because of their close tie-in with state governments, these outfits are politically potent. They can and have made Congress jump through hoops.

While state control over the Air Guard would not be a direct issue in creating an Air Guard Bureau it would be hovering in the background. Moreover, the argument could be advanced that state Adjutants General and other state guard officials not connected with the air units might find themselves frozen out of (*Continued on page 62*)

HAVE YOU SEEN?

Newest penetration fighter for Air Force is North American YF-93A, powered by Pratt & Whitney J-48 turbojet with after-burner. Engine delivers 6,550 pounds static thrust. Span is 39 feet, length 44 feet, height 16 feet. Plane is developed from the F-86 (*Sabre*).



Contra-rotating prop of Westland *Wyvern* has eight blades. A carrier-borne single-seat naval strike fighter, the British plane is powered by 3,500-h.p. Rolls-Royce *Eagle* 22 engine.

★

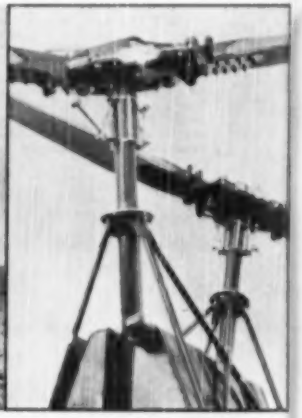
Experimental "Helidyne" convertaplane will eventually be fitted with wings. Two 375-h.p. engines drive both rotors and props. At high forward speeds, rotors will be used for lateral control only.

World's largest passenger plane is used by English for flight research. Bristol *Brabazon's* span is 230 feet, length 177 feet, height 50 feet. Craft is powered by eight 2,500-h.p. Bristol *Centaurus* engines. Inset shows how engines are coupled in pairs and buried in wings. Note comparative size of man (arrow).

Bellanca's 1950 Cruisemaster cruises at 180 m.p.h. on new 190-h.p. Lycoming engine. It has Hartzell controllable prop. Stalling speed is 43.6 m.p.h., range is 680 miles. The four-place lightplane has hydraulically operated landing gear and flaps and sells for $9,500.

Snow-sled manufactured by Vest Aircraft Company from Ercoupe fuselages is called *Snercoupe*, will travel 60 m.p.h.

In active service with RAF, DeHavilland 113 night fighter is two-seater fitted with radar. Its nose and cockpit design are based on the *Mosquito*.



Kaman XHK-225 prototype helicopter is being tested by Navy. Craft is powered by 225-h.p. Lycoming engine. Excessive droop of outer rotor tips at slow speeds is eliminated by small device just below rotor mounting (right). Device restricts droop as rotor slows down.

Ready for road, *Aerocar* pulls its "flight component" trailer. Flying auto, designed by Moulton B. Taylor, is being built in Longview, Wash. "Test flying has been held up by ice and snow on runways," the manufacturer reports, "but we should be flying steadily by spring."

I Learned About Flying From That! NO. 125

By
PAULINE M.
DYER

An Air Force nurse stationed at McChord Air Force Base, Wash., Lieutenant Dyer has been flying for 11 years. She now holds a commercial ticket with a multi-engine rating.

Plane "landed" on treetops at night, then tipped on left wing and slid through branches to ground. No one was hurt but wings had to be removed to extricate plane from forest.

She took off at dusk, got lost—and the inevitable happened.

WE TOOK OFF from San Mateo, Calif., just before noon on December 27—and just at noon on January 1, our 90-h.p. Cessna 140 was circling the Sugar Bowl in New Orleans. We had flown through lower California, into Arizona, New Mexico and across Texas.

After seeing as much of New Orleans as possible in 12 hours, we flew the next morning to Gulfport, Miss., to visit briefly with friends of Sally Huffman, my co-pilot. Originally, we planned to take off for McComb, Miss., where my brother would meet me by 3 p.m. But we were late returning to the Gulfport field and, knowing my brother would be waiting, I hastily gave the mechanic my credit card to pay for gas, stuffed the receipt in my pocket, and with the briefest of checks we took off.

An overcast sky and approaching darkness made us decide to land at Tylertown, Miss., which was 1 hr. 35 min. from Gulfport—and a short 18 miles from our goal, McComb. The field was a CAA emergency airport, which carried no fuel. It was here we discovered our gas supply was almost exhausted. We should have had a five-hour supply when we took off from Gulfport. I had not, however, taken time to make a visual check.

We talked to the caretaker, and after hearing that McComb was equipped for night flying, we decided to make the short hop in the dark. The sky had cleared and visibility was excellent. We took off, found McComb in just 10 minutes and circled the area where the airport was located, according to our map. Unable to detect any sort of runway lights, we reluctantly returned to the Tylertown airport and landed again at the CAA airfield.

With the help of the caretaker, we reached the nearby town and phoned my brother, Bill. Then we spent the night with him and his family.

The next day, it appeared that if we were to get the plane to McComb for servicing, we would have to fly it over that afternoon, as my brother couldn't drive us to the Tylertown field on Tuesday morning. We wanted to begin the return trip on Tuesday noon, as weather reports indicated a change shortly.

So on Monday, Bill, with his wife Marguerite and his little son Billy, drove us to Tylertown. We stopped at a filling station near the airport and bought five gallons of automobile gas to take the Cessna to McComb. Pouring this into the right tank, I made a line check and found the plane ready to fly.

Then I asked my sister-in-law and nephew if they'd like to take their first flight in a plane. That sounded fine to them, and we arranged to meet Bill and Sally at the McComb airport. As I fastened Marguerite's safety belt, I noted that an overcast had formed and the sky was hazy. But I was certain we would be on the ground in 20 minutes, while it was still light.

After 15 minutes of flying, I became alarmed. McComb was nowhere in sight. The haze was increasing and the deepening twilight added to the strain. Lights began to flicker on beneath us, and this made me decide that we had flown past McComb—on one side or the other. I figured that if we turned back I (*Continued on page* 42)

More modern airliners are equipped with GOODYEAR wheels and brakes than any other kind

—and the number's increasing steadily

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is: "To make flying more useful, less expensive, safer and more fun."
Headquarters are: 15th and New York Aves. Washington 5, D. C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING MAGAZINE.

OMNI CHARTS

A new group of sectional charts featuring omni range stations is now available for the Northeastern part of the country. The Coast and Geodetic Survey, working closely with AOPA and the CAA, has also added ready reference material to the back of each chart. In addition to a list of aeronautical symbols, the chart carries information on airport traffic patterns, instrument and visual flight rules, flight plans, research and rescue procedures, emergency code distress signals, and weather broadcasts.

AOPA invited comments from its members who had seen and used the first omni chart, an experimental sectional covering the Washington, D. C., area. Many of the resulting suggestions from members have been incorporated in the new charts.

The new charts, which will replace all current sectional charts before the end of June, are available now for Huntington, Norfolk, Washington, Winston-Salem, Albany, Aroostook, Boston, Burlington, Lewiston and New York.

AOPA members may order the charts individually or on a subscription basis for 25 cents each through AOPA's map service.

DRUG WARNING

CAA's medical division recently issued a warning to pilots not to fly after taking antihistamine drugs. Dosages large enough to kill a cold may also cause drowsiness and dizziness.

Pilots were also cautioned against taking the airsickness remedy, Dramamine, while flying.

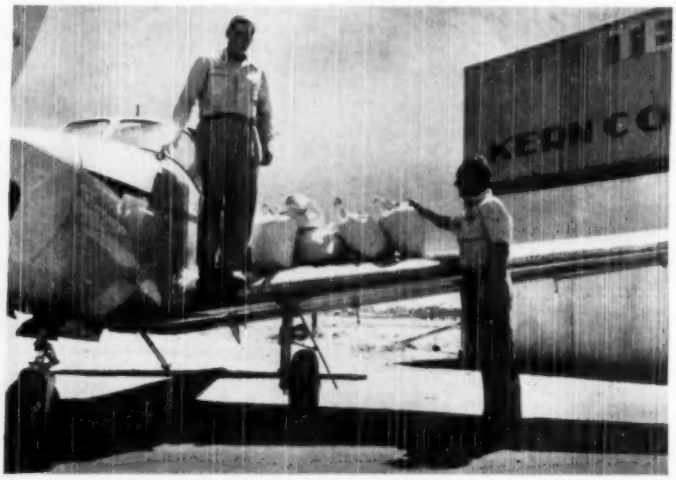
DETERGENT OILS

Acting on the request of one of its members, H. W. Jobes (AOPA 46704), AOPA has recently collected information concerning the use of detergent oils in personal aircraft engines. Pending the results of the CAA investigation of these oils, AOPA plans to issue a special report to its members giving them general information about this particular type of lubricant.

Until additional experiments have been made, AOPA urges its members to check with the engine manufacturer before using detergent oils in their aircraft engines.

WEATHER PADS

AOPA's weather pads, a limited supply of which were made available last fall to fixed-base operators, have been revised on the basis of members' suggestions. A supply of the new weather pads has been printed and AOPA members may order them, without charge, from national headquarters in Washington.



Farmer-pilot Ray Henning of Bakersfield, Calif., stands on wing of his *Navion* with 400 pounds of alfalfa seed for which he flew 1,300 miles. (See item.)

FLIGHT GUIDES

AOPA Foreign Flight Guides covering all of Alaska, Mexico, and Central America are now available free of charge to AOPA members.

AOPA's general Foreign Flight Guide tells how to obtain flight clearances from the U. S., where to get passports, and what to take on a foreign flight. In addition, a booklet covering the customs, immigration, and flying regulations of each country in Central America is now available. General information in these guides tells, for example, what month in Mexico City is the rainiest and what kind of clothing is needed for a visit to Guatemala City. Each Guide also contains navigational aids and a complete list of airports.

AOPA plans to issue Foreign Flight Guides for each country in South America in the near future.

AOPA members planning foreign flights can order these pilot service bulletins from national headquarters.

FLYING ALFALFA

Ray Henning (AOPA 37173) a Bakersfield, Calif., farmer and *Navion* owner, recently flew 1,300 miles to Montana for a load of scarce "Ranger" alfalfa seed. Eight 50-pound sacks of seed were loaded in his personal plane for himself and fellow-farmers in California's Tehachapi Valley. (See cut.)

Flying the alfalfa seed to the West Coast enabled Henning and his friends to plant their crop immediately without having to wait until fall.

THUNDERSTORM FLIGHTS

CAA recently reported the results of Air Force thunderstorm flight tests in CAA Aviation Safety Release No. 304. Aircraft used in the project were Northrop P-61 (*Black Widow*) night fighters, selected because of their structural strength, high service ceiling, and complement of complete radar equipment. Five of these aircraft flew a total of 38 thunderstorm missions consisting of 812 traverses through thunderstorms.

The severest sharp edge gust measured in any of the flights approximated 43 feet per second velocity (CAA design criteria consider 30 feet per second as a maximum gust for personal planes at normal crusing speeds.) Checking the airspeed altitude record in the airplane exposed to the above velocity showed it had entered a large updraft which carried it from 14,800 to 20,000 feet in 70 seconds at an average rate of climb of over 4,400 f.p.m. Maximum updraft recorded by the instruments during this climb was about 6,200 f.p.m.

Although the *Black Widow* withstood severe structural damage, skin cracks as long as two inches were found on the horizontal stabilizer after the flight.

Effects of lightning, hail, and icing resulting from thunderstorm flying also were studied.

General conclusions of the report indicated that thunderstorm flying is extremely dangerous unless the pilot is proficient in all phases of instrument flying and the airplane can withstand unusual stresses.

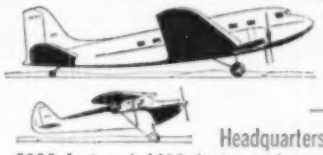
PLANE FAX

Light aircraft operators reduce overhaul expenses 45%

"We've extended the overhaul period on our privately owned light aircraft from 600 to 1100 hours by using RPM Aviation Oils," write L. E. Kershner and Floyd Murphey of Aircraft Sales Company, Prescott Municipal Airport. "This has cut our overhaul costs about 45%. For planes such as we have operated and are now operating, we are glad to recommend RPM Aviation Oil for more successful operation and less expensive flying hours.

Quick picture of PRESCOTT AIRPORT Arizona

Key airline base—1 scheduled plus 11 passenger and 2 cargo non-scheduled airlines



24-hour CAA radio and weather service

Headquarters—Two flying schools

6000-foot and 4400-foot paved runways—full taxi strips

"No other lubricant we've used has kept our engines so clean . . . so free from rust and corrosion. We've had no difficulty whatsoever with crankshafts, cylinder walls or bearings since the day we switched to RPM Aviation Oil."

TIP OF THE MONTH

"Take advantage of local radio and weather facilities— they're free."

"Pilots could help themselves to safer, more pleasant flying if they'd only be sure to use the radio and weather facilities available at many fields. It's strange—but true—that some plane operators having radio equipment in their own planes pass up these facilities entirely."

L. E. KERSHNER, Mgr.,
Aircraft Sales Company, Inc., Prescott Airport.

Modern, round-the-clock service for all transient aircraft

Prescott Airport's manager, Jack Bucher, explains: "Thanks to the large flow of airline traffic through Prescott Airport, visiting pilots from other fields may enjoy complete guest facilities here. That includes a modern terminal building, cafe, overnight cottages, repair and overhaul services, and all Standard products—powerful new CHEVRON 80/87 Gasoline, RPM Aviation Oils and Greases."

CHEVRON AVIATION GASOLINE

RPM AVIATION OIL

Standard Oil Company of California

THE MAIL BOX

AVIATION MAN OF THE YEAR?

J. B. Hartranft, Jr.

Time Magazine stirs up a lot of interest with its "Man of the Year" selection. . . . How about a FLYING-sponsored "Aviation Man of the Year?"

My candidate: Joseph B. Hartranft, Jr., who has, in my opinion, done more for private aviation than any other individual.

JOHN H. HOFFMAN
Kennett Square, Pa.

SIGHT-SAVER

I fly north and south a great deal and the sun shining into the cockpit of my AT-6 from the right and left has been a constant bother. I find that if I wear dark glasses, I get a pupillary contraction and my forward vision through the dark glasses is impaired. The use of clear glasses under these circumstances is equally as bad because of the same contraction of the pupils and the glare from the front. However, I have found an answer which is extremely simple, and that is to wear either plain or colored glasses and put a paper folder of matches across the temple piece of the glasses and shut out the lateral source of light.

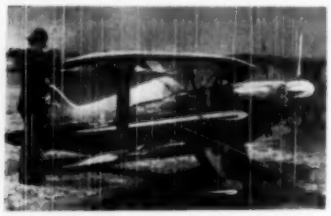
I find that by doing this, the amount of fatigue is remarkably diminished in north-south flights.

W. L. MARXER, M.D.
Beverly Hills, Calif.

A BOBBY LOOKS AT LITTLE STINKER

You may have heard that consideration is being given to changing the traditional English policeman's helmet for the peaked cap such as is worn by the police in your country.

In view of this, thought you might be interested in the enclosed photograph of



an English "bobby" looking at Betty Skelton's midget biplane, *Little Stinker*. It was taken at Gatwick where she gave an excellent demonstration of aerobatics last summer.

OLIVER STEWART, Editor
Aeronautics Magazine
Surrey, England

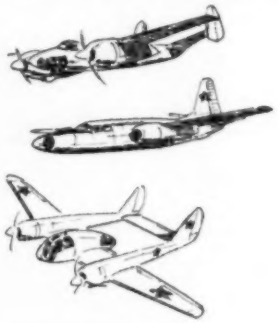
NEWS FROM JAPAN

I am having a position as an aviation writer in our country although we can't get any real aircraft in hand.

The other day I received comparatively interesting information on the Russia's aircraft from an repatriate who worked [as a slave] in the Siberia districts. The information is as follows:

- In the Far Eastern theater they have many fighters—half are propeller-driven (La-9's, Yak-9's) and the rest are jet-powered (Yak-15's, Mig-9's).
- Russia has very few standard airfields; they use the deserts and grass ground as airstrips.
- The repatriate saw an improved TU-2 used as a target-towing aircraft; she has a shoulder wing and elongated rudders.
- The medium jet bombers that have two-jet units resemble the U.S. Martin *Marauder* in the rough design.
- There also existed some bomber-escort airplanes which have two air-cooled engines and two tails [resembling] the German FW-189 attacker.
- He also saw a 60-passenger helicopter.

I am enclosing three of my own sketches



of Russian aircraft which may interest you. I feel very happy to tell you the information I heard from the repatriate. . . .

HIDEYA ANDA
Tokyo, Japan

U-DRIVE-IT

I agree with Gregory Cooper ["The Mail Box," December, 1949, FLYING] that private flying would benefit greatly by automobile rental service at airports.

I realize that the U-Drive companies aren't going to stock every cow pasture in the country with shiny new cars, but what about the fixed-base operators? What's wrong with their having a few cars around to rent to transient pilots?

Now before anybody starts asking, "Who is going to pay for it?", remember that the cars wouldn't have to be new. Pre-war cars (35's to 41's) can be bought from $150 to $500 (at least on the West Coast) and although many of them are junk, many more are still good transportation, especially if fixed up a little bit.

For the price of a Cub or a used Cessna, the fixed-base operator could have a few of these older cars to rent to cross-country pilots who would otherwise be afoot. A few extra dollars could be made and it would be a great boost to private flying.

Everytime I get into an argument with a non-flyer about the advantages of flying a lightplane, the first thing he says is, "But what do you do when you get there?"

The lack of ground transportation is truly one of private flying's biggest problems . . . and to think it could be solved almost overnight!

How about some comment on this idea, especially from the fixed-base operators?

OIVA KARI
Poulsbo, Wash.

HY CAUSES A PAIN

My wife brought me my regular copy of FLYING at the dispensary where I am recovering from an appendectomy. I skip-read it for a while until I came to "Hy Sheridan Flies the Lightplanes" [February FLYING]. That article was *too* good. Each time I laughed I doubled over with sharp pains.

It was with much regret that I decided to read the article at a later date. . . .

GLENN A. SNELL
USN Submarine Base
New London, Conn.

I am an active Canadian private pilot and have been a constant reader of FLYING for the past 15 years. . . .

Hy Sheridan

I particularly enjoy the articles and columns written by that Master Humorist, Hy Sheridan. He has an unbeatable sense of humor and he knows what he's talking about. . . .

I cannot recall ever seeing an actual photograph of him. How about it?"

RICHARD A. WHELAN
Ottawa, Canada

- If Reader Whelan keeps back copies, he'll find a photograph of Humorist Sheridan in the July, 1945, issue ("I Learned About Flying From That! No. 69") and again in July, 1949 ("Debate on Relativity").—ED.

THE RULES THAT SHACKLE

You certainly said a mouthful in your article "The Rules That Shackle Plane Improvement," [February FLYING].

The best "control" on airplanes and airplane design is Mr. John Q. Public. After all, Mr. Public is in charge of his life and if he doesn't like something, he's not going to buy it. The asinine "laws for safety" are slowly crystallizing the situation to the point where the sale of airplanes is approaching a low ebb indeed. Rugged

(*Continued on page 63*)

Northrop student engineers designed and built these pulse-jet engines as a typical practical project assigned as part of the Institute's up-to-the-minute instruction in principles and operation of latest types of aircraft power plants.

Aeronautical Engineers are pushing ever upward the curve of aircraft performance and air transportation. *Aviation* depends on engineers... and their profession... for its constant and amazing achievements and growth. A career in *Aeronautical Engineering*—the key division of *Aviation*—can be YOUR *personal plan for progress.*

Here is a career of lifelong adventure... *for YOU*... in the great *Air Age*. Besides fascinating work, you enjoy these rich rewards—good pay from the start... wide-open opportunity for quick advancement... putting your own original ideas into action... the security of a big, growing industry. And in *Aeronautical Engineering*, whether you are *creative or practical by nature*, there is a place for your particular talents and ability.

Start the upward "curve" of YOUR plan for progress ...with *Northrop* training. You are already IN aviation when you train at *Northrop*. You enjoy big advantages that have won choice jobs for graduates with ALL leading aircraft manufacturers and airlines. Get the full story, in the big illustrated Institute catalog. Classes start every 8 weeks—you can start YOUR training soon.

Experience duplicating every-day engineering duties in aircraft plants is an important advantage of NAI training. These students are testing a nose wheel installation for braking effects, in the Institute "test lab."

FOR THIS CATALOG—SEND COUPON NOW

Northrop *Aeronautical Institute*

1519 EAST BROADWAY, HAWTHORNE, LOS ANGELES COUNTY, CALIFORNIA

Division of Northrop Aircraft, Inc.
James L. McKinley, Managing Director

NORTHROP AERONAUTICAL INSTITUTE
1519 E. Broadway, Hawthorne, Los Angeles County, Calif.
Please send information on opportunities in Aeronautical Engineering, your catalog, and starting dates of classes. I am interested in:
☐ Aeronautical Engineering ☐ Aircraft & Engine Mechanics

NAME _____ AGE _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____
Check one: ☐ VETERAN ☐ NON-VETERAN

highest approvals

Veterans Administration—Engineers' Council for Professional Development—Civil Aeronautics Administration—National Council of Technical Schools—California State Board of Education—U. S. Dept. of Justice, Immigration and Naturalization Service

LOGGING TIME

WITH HY SHERIDAN

Captain, American Airlines

LET'S MAKE THE SUN STAND STILL

We have some jet planes that go pretty fast now, and they are getting faster all the time. The sonic barrier has been punctured so much that it doesn't put up a very neat appearance any more. So you know what the next thing is? It will be going around the earth as fast as the sun does. For the pilot, the sun will stand still.

If the pilot takes off with the sun directly overhead, at sun-time noon, it will be noon all the while until he lands back where he started. To me that's boring, to have it noon all the time, but someone is bound to do it soon. Now, I ask you. It's tomorrow for the people where the pilot lands back at, but what day is it for the pilot?

The plane won't have to fly so very fast, not really faster than they are going now, but it will have to have a longer range, that is all. How fast? A trifle over 1,000 miles an hour at the equator, and less than that if the pilot follows a parallel that is nearer the pole. How far north, or what parallel would have to be followed by one of the 680-m.p.h. planes we now have?

What kind of a speed record would you call it to fly around the world at noon—that is, in nothing flat?

* * *

AFTERTHOUGHT

As for me, I don't like these fast days a bit, and it certainly doesn't seem that we have improved life and the quest for happiness any at all. Maybe I'm old-fashioned, but some of the old fashioned things you can't improve upon. Just give me a blond and an hour-glass.

* * *

A BRAVE MAN

I used to jump parachutes, trying to get the U. S. Air Service, as it was then called, to adopt them, and each time I jumped I died. That first step was the trouble, that first step into nothing. This story is a tribute to another man and a brave one who took quite a step, a big step, into the unknown. It was only one step, but that's all you get with that kind.

You remember the trouble Lou Gehrig had? It always seems to fasten onto the better kind of fellow. It happened to a young captain of American Airlines. The disease started so slowly, as is its way, that it was many months before it was recognized as the hopeless lateral multiple sclerosis.

This disease progresses slowly for years until the inevitable end. No doubt the young captain thought of the case of Lou and what a nervous and financial strain it had been on Mrs. Lou. The captain had a year-old baby girl. He did some thinking, we may be sure. He thought of his baby as a young girl, growing up and not laughing much.

The captain sent his family on an outing. When they were gone he climbed up to the little workshop that he had above his garage where he had spent so many happy creative hours. There it was that he took that big step . As I said, he was a brave man.

* * *

AND WITH REASON, TOO

Although they are careful to say so only in private, most men feel that women are not really intelligent. Strange to say, a man seems first to acquire the feeling on the day that some woman accepts him.

* * *

THE GLASS EYE

On the evening in question the atmosphere about the Chicago airport was full of smoke and airliners and you couldn't see nearly as much as you thought you could, especially the tiny navigation lights of other airplanes. Some lad in the tower must have understood something about flying because he manned the radar scope in order to warn pilots who might be on collision courses. The airliners are 95 per cent blind in clear weather, for that matter.

Your reporter was nearing Chicago himself and heard the following conversation over the radio. The lad on the scope spoke to a United pilot who had asked for authority to land. "You are number three, following the *Constellation*."

"Where is the *Connie*?"

"Crossing under you—right below you now."

"Darned if he isn't. Pretty sharp tonight, aren't you?"

"And I did it with my glass eye, too."

* * *

EPITAPH

He didn't clean his plugs;
Now he's a dish for bugs.

I Learned About . . .

(*Continued from page 36*)

would then be able to see the large cluster of lights which would indicate the town. I made a wide, sweeping 180° turn—and "swept" a little too far. Then I was really lost. I could see several beacons, but the poor visibility prevented me from seeing the green light which indicated the Tylertown field.

Just about that time, I saw a large cluster of lights on my left. This, I assured myself, was McComb. With relief, I circled the town, knowing that flares would be put out for me. In a short time, relief turned to dismay as I realized this could not be McComb—and there was no airport. With sinking heart, I looked at the gas gauge and knew that I couldn't chance setting off across country looking for Tylertown. I would have to make my landing, for better or worse.

The townspeople soon realized I was in distress, and shortly I was being signaled with every sort of light imaginable. Unfortunately, if any messages were flashed, I was unable to interpret them, and could only continue to circle, looking for a possible landing spot. Finally, knowing there was not much time, I decided on an apparently straight and level stretch of highway on the outskirts of the town. I circled for a closer look when I noticed a vigorous signal on my left. Someone was flashing a light with a sweeping motion along the ground, and it looked to me as if he were trying to indicate that a field lay directly ahead of him. Taking new hope, I turned in that direction and dropped lower, intending to drag the area with my landing light on. Hoping to get a better angle for using the light, I pulled on the flaps, and then snapped the switch which would bring the light down from the wing. The light snapped on, and in the sudden glare I saw treetops loom up ahead of me—and above me!

Pure instinct functioned. I hauled back on the wheel and prayed. The Cessna swept upward, faltered, then stalled out and dropped back. Ever so gently, the plane rested on the trees for a second, then tipped onto the left wing and slid through the branches, coming to rest with the prop and left wing tip buried in the mud.

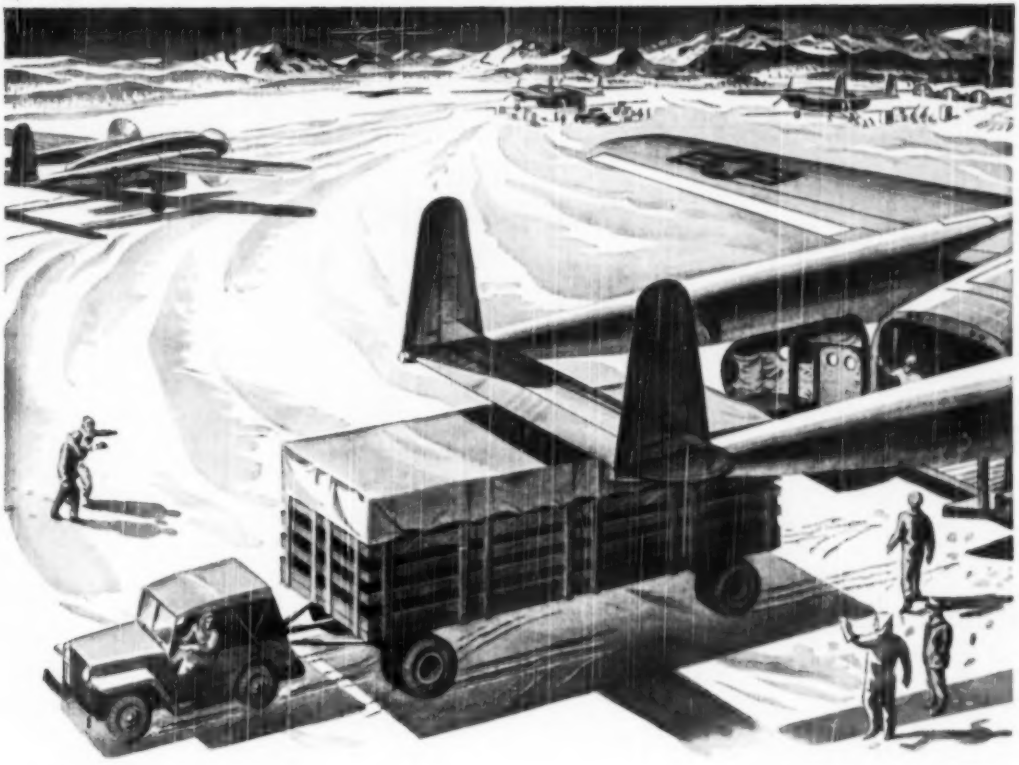
In complete unbelief, I opened the door and climbed out, to stand on the wheel and reach back for little Billy. In another instant, a man came racing through the trees, and believing I had preceded him to the scene, shouted: "Is he dead?"

I looked at him blankly, and then as he came up to the plane and took in the details, he turned pale and muttered:

"My God, two women and a baby!"

Marguerite had a bruise on her forehead, but that was the extent of injuries. The damage to the plane was remarkably light, considering the possibilities. The wings had to be removed in order to pull the plane out through the trees.

Since that time I have been certain that a Co-Pilot was riding with me, to give me another chance when my negligence endangered the lives of others. No other explanation seems reasonable. END



DELIVERY—

Via the Air Route

The Military Air Transport Service (MATS) contributes to the mobility of the Armed Forces by airlifting cargo and personnel *whenever* and *wherever* needed to fulfill national military requirements.

Fairchild C-119 Packets, soon to be flying for the Military Air Transport Service, help fulfill this vital air transportation mission. Capable of carrying 64 passengers or 10 tons of cargo, this twin-engine transport and cargo plane has the *versatility* to accomplish numerous types of operations required via the MATS Air Route.

The C-119's unique rear loading at truck-bed height allows for rapid handling of cargo, eliminating the necessity for extra ground handling equipment. Airplane engines and parts, bulky communication equipment, vehicles, tanks and field kitchens are some of the many military items the Fairchild C-119 carries with ease. In addition to its utility as a cargo plane, the Packet is equally efficient for air-evacuation, air-sea rescue, and personnel transport.

The C-119 is one of a series of Fairchild transport planes which will continue to play a versatile role in the operations of the world wide Military Air Transport Service.

ENGINE AND AIRPLANE CORPORATION

FAIRCHILD *Aircraft Division*

HAGERSTOWN, MARYLAND

Britain Takes Lead

(Continued from page 25)

journeys considerably shorter than the world's trunk route stages. It may even find useful application on the longer intercity stages of less than 1,000 miles. This opens up opportunities for fleet standardization that were not foreseen in the early days of the project.

Since its first flight on July 27, 1949, the *Comet* has amassed well over 100 hours of flying time. Its design cruising speed has been announced as approaching 500 m.p.h. at about 40,000 feet. Since that time the *Comet* has attained speeds approaching 600 m.p.h. and there is no reason to suppose that, with a full complement of passengers, the design figures will not be reached.

De Havillands have succeeded in maintaining a very rapid tempo in the *Comet's* flight development program, a highlight in which was reached on October 26, when the prototype flew from London to Castel Benito (1,490 miles) at an average cruising speed of 440 m.p.h., landed to refuel, and then returned at an average speed of 456 m.p.h., touching down at London Airport 8 hr. 46 min. after its departure.

Fifteen *Comets* are at present on the assembly line, 14 of which are on order for British Overseas Airways Corporation and should be delivered during 1952. No other firm orders have yet been announced, although it is known that various airlines in other countries are interested.

Among British turboprop airliners the two most interesting are the Vickers *Viscount* and the Armstrong Whitworth *Apollo*, for these are the ones most nearly ready for practical use under present conditions.

The prototype *Viscount* has proved surprisingly free of teething troubles during its 18 months or so of flight development, and much air experience has been gained. The early tests were carried out with Rolls-Royce *Darts* delivering 1,000 shaft horsepower each, but the present units, which have now been developed up to 1,420 s.h.p., are derated for official tests in order to avoid repeating some tests at higher power.

The prototype is to be followed by an enlarged version known as the *Viscount* 700 which will be powered by four *Dart* RDa3 turboprops giving 1,400 s.h.p. plus 295 pounds static thrust each and have a fuel capacity of 2,160 U.S. gallons. The increased accommodation, 40 to 53 seats, is likely to give it a wider appeal among operators.

The recent placing of orders for the *Viscount* 700 by two corporations may have a far-reaching effect as it is well-known that many potential foreign buyers have been awaiting evidence that the British themselves have faith in their own turboprops. This has now been given and it may therefore be assumed that Britain's nationalized airways corporations believe that the operational problems, especially those associated with the higher fuel consumption of turbines, are on their way to being solved.

The 12 *Viscounts* ordered by British Overseas Airways Corporation are to be used by British West Indian Airways on its Caribbean network—virtually in the American "shop window"—and the unspecified number ordered by British European Airways—believed to be about 25—will presumably be used on low-density routes where the *Viscount* can fly for a reasonable period at its most economical operating height of 25,000 feet.

The busy short routes such as that between London and Paris are unlikely to be considered suitable for the operation of turboprop airliners.

From the pilot's viewpoint, the *Viscount* is docile in the air and handling differs little from piston-engined airplanes. Airline pilots who have flown the original *Viscount* have reported easy maneuverability, light stick loads, and good stalling characteristics throughout the entire speed range. The elevator spring tab materially assists change of trim when lowering the flaps, and the cutting of an engine does not cause any violent swinging. Take-off and climb can be effected on three engines and adequate control remains even in the eventuality of a failure of two engines on the same side.

Whereas the *Darts* of the *Viscount* 700 are of axial-flow type, the Armstrong-Siddely *Mambas* of the *Apollo* are of centrifugal type, and its gross weight is only 43,000 pounds as compared with the 50,000 pounds of the former. As yet no firm orders have been placed for the *Apollo*, though some interest is being shown by operators in both Europe and South America. Powered by four 1,010 s.h.p. *Mambas*, which also furnish 307 pounds static thrust each, the *Apollo* can accommodate from 24 to 40 passengers, according to the routes operated. With a take-off weight of 43,000 pounds—which includes 1,188 U.S. gallons of fuel—the *Apollo* has a maximum payload of 10,000 pounds and a maximum stage length of 1,200 miles at 20,000 feet at 276 m.p.h. (including stand-off and alternative reserves). The plane's maximum speed is 345 m.p.h.

These three aircraft were designed from the outset for gas turbines, whereas the first U.S. turbine-powered transports, like the Handley Page *Marathon* Mark 2 and the Handley Page *Hermes* Mark 5, will be conversions of such existing piston-engined designs as the Martin 2-O-2 and the Convair 240. Both the *Marathon* 2 and the *Hermes* 5 are purely experimental airplanes. They are useful in providing a direct comparison with their piston-engined counterparts.

Whereas the *Marathon* Mark 1 has four *Gipsy Queen* 70 piston engines providing a total of 1,380 h.p. for take-off, the Mark 2 version has two *Mamba* turboprops giving 2,020 h.p. total. Naturally, with all this additional power, performance is considerably snappier. When the *Mamba-Marathon* was first displayed to the press, prior to the S.B.A.C. show last year, the airplane was flying light. All-up weight was about 13,000 pounds, and it gave a remarkable demonstration after climbing fast from a take-off run of only some 300 yards. The pilot's confidence in his mount was admirably demonstrated by a low-level fly-past on one turboprop alone. If production of the *Mamba-Marathon* were undertaken, it would have an all-up weight of about 18,000 pounds and a maximum range—with 20 passengers—of something like 900 miles.

The *Hermes* 5, which flew initially on

15 YEARS AGO

FROM the April, 1935, issue of this magazine:

Sectional airway maps covering the entire United States were being completed by the Bureau of Air Commerce to replace the old strip maps.

The Stearman Model 73 (NS-1) biplane was the Navy's newest primary trainer. Powered by a 220-h.p. Wright engine,

the two-seater had a top speed of 123 m.p.h., cruised at 105 m.p.h., and landed at 51 m.p.h. Service ceiling was 13,500 feet and range 320 miles.

Aviation experiments at the University of Illinois proved that "one may get drunk on air." According to the tests, "normal persons who breathed air containing only half the usual oxygen content insisted that four times four did not make 16 . . . and became very angry at those who disagreed."

The Lanier Vacuplane, "latest and final one of five experimental planes using a new vacuum cell principle," was

tested successfully at Troy, N. Y. [See "The Paraplane," September, 1949, FLYING.]

Airports and landing fields in the United States totaled 2,297. [Total at the present time is 6,433.]

Type	1935	1950
Municipal	702	2,166
Commercial	570	2,621
CAA Intermediate	259	139
Military	86	361
Private and others	680	1,146

TWENTY YEARS AGO

The Fokker Aircraft Corp. heralded its New York showing of "the largest landplane built," the F-32.

(Partial view of the enormous new lubricating oil plant at Lake Charles, La., where this great new oil is processed.)

"ANTI-FOULING" OIL made by the Remarkable new "HEART-CUT" PROCESS

This new oil—the best known to science... gives you a cleaner engine... more economy ...minimum carbon residue.

It's here now! The remarkable motor oil from the giant new $42,000,000 lubricating oil plant at Lake Charles, La. The plant that's been the big talk of the oil industry for months.

New Premium Koolmotor is made by the unique "Heart-Cut" Process which retains only the choicest part of the finest crudes. *It's so superior that in recent engine tests it outscored nine other major premium motor oils.* No wonder Premium Koolmotor is better in every way! Cleans better, seals better, cools better and fights acid, sludge and corrosion far more effectively. Switch to this remarkable new oil today.

start saving Dollars today... stop at

CITIES SERVICE

BETTY SKELTON'S NOTEBOOK

PLANES AND PILOTS AT THE AIR MANEUVERS

All three days of the Miami Air Maneuvers were blessed with blue skies and plenty of excitement for the 25,500 spectators . . .

BOB DOWNEY of Whittier, Calif., flying his midget racer, *Shoestring*, had the race pilots worried when he qualified unofficially at the unbelievable speed of 204 m.p.h. on one lap around the Continental course. It's rather a mystery since he finished third in the final race at 181.334 m.p.h. . . . RODNEY JOCELYN of Langhorne, Pa., a likeable kid who had never taken part in a large air event, left everyone speechless when he walked away with the Gulf National Aerobatic title. Rod is a crop-duster and flew his old model Great Lakes powered by a 165-h.p. Kinner. He modestly insisted that he was entering the big event only for the experience. Brother, if he's just getting experience now, wonder what he'll do when he really gets hot! . . . *Dragontail*, a midget pusher-plane owned by PAUL SCHROEDER of Rochester, N. Y., always appeared to be flying inverted as the rudder is mounted downward. Looks as though it will take a while for the pusher designers to iron out their problems as neither *Dragontail* nor a pusher entered by ART BECKINGTON of St. Louis made the starting line.

Everyone was intrigued with the homebuilt "brainstorms" which could be found on every corner of the ramp . . .

While CHARLES BAILEY of Madison, N. C., was building his high-wing midget, onlookers kept asking him what "that thing" was—so he named it *The Thing*. It has a wingspan of 12 ft. 4 in., weighs 540 pounds empty, cruises at 145 m.p.h., and can climb 1,500 f.p.m. with its 115-h.p. Lycoming. On a recent cross-country, Charlie landed *The Thing* on a highway when he lost his bearings and got low on gas. As he rolled to a stop near a building beside the road, a man came tearing out and exclaimed, "Where'd you come from? I didn't see you enter the pattern!" It was then that Charlie saw the boundary markers and the grass strip he had been looking for—right next door to the highway!

If you think the California *Wee Bee* is small, wait until you see the *Stits Junior* now claimed to be the "world's smallest." RAYMOND STITS of Battle Creek, Mich., started construction on it in August, 1948, with the sole objective of building the world's smallest plane in which the pilot sits upright in the cockpit. After it was completed, Stits found he was too large to fly it himself, so ex-fighter pilot BOB STARR has the tricky job of piloting the plane which many veteran pilots have said simply won't fly. Total cost of the little job was $2,000 (first three test flights ended in crackups). Overall length is only 11 ft. 4 in. The wingspan is 9 ft. 5 in., and net weight 398 pounds. Powered by a 75-h.p. Continental, the *Junior* has a cruising speed of 150 m.p.h. and lands at 65 m.p.h. Stits says he has stopped trying to convince people that it is a real plane and not a model. They don't exactly call him a liar—just say they'd have to see it fly to believe it!

Lieut. Col. BILL HAVILAND of the 159th National Guard Fighter Sqdn., made everyone's heart skip a beat when he zoomed past the stands with part of the elevator missing on his F-80 jet. His wing man had become a little too chummy during a formation pass in extremely rough air. So, with limited elevator control, Bill demonstrated an emergency jet landing by plowing through six fences and coming to a stop in a pasture several miles from the airport. Unscratched, he climbed from the cockpit and drawled, "Life gets tedjus, don't it . . ."

Betty Skelton

August 22, 1949, is structurally similar to the piston-engined Mark 4. The four Bristol *Theseus* turboprops, each giving 2,490 s.h.p., are fitted in similar nacelles to the *Hercules* engines of the *Hermes* 4, but, as they are somewhat lighter than the piston engines, they are installed further forward of the wing leading edge, enabling the jet outlets to be positioned under the wings at the engine sides and thereby circumnavigating the structural alterations that would have been involved by leading the jet pipes through the wing and out of the trailing edge. Estimates give a maximum range of 3,000 miles at 30,000 feet with 4,100 pounds payload and with no fuel reserve. With a payload of 17,000 pounds, range is expected to be 1,550 miles. A second *Hermes* 5 is under construction.

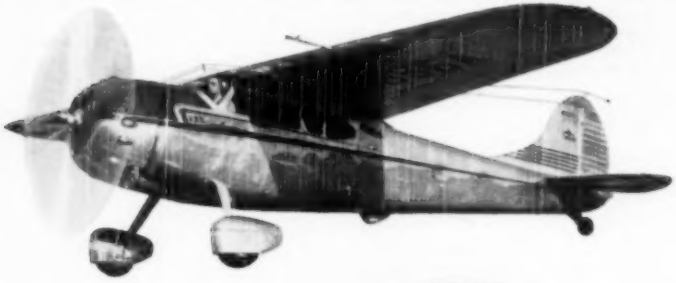
On the not-so-distant horizon are three other turbine-powered commercial airliners, the most spectacular of which are the Saunders-Roe *Princess* and the *Brabazon* 2. The third is the Bristol 175. The 10-engined *Princess* was to have been completed by the end of the year but will not now be ready until mid-1951 owing to a delay in developing the 3,500 s.h.p. Bristol *Proteus* III turboprops. It is a 313,600-pound flying boat intended to carry 105 passengers across the South Atlantic at a cruising speed of 380 m.p.h. at 40,000 feet. Despite the *Princess'* size, the weight/power ratio is only nine lb./h.p., and three are under construction at present for the nationalized British Overseas Airways.

The Bristol *Brabazon* Mark 2, powered by four coupled pairs of Bristol *Proteus* turboprops, is not in such an advanced stage of construction as the *Princess* and therefore the delay in developing the *Proteus* engines to a sufficiently high standard is unlikely to impede its completion. The turboprops will give considerably more total power than the eight *Centaurus* piston engines of the *Brabazon* Mark 1, and the aircraft will be furnished to carry 101 passengers by day or night and is intended for operations by British Overseas Airways. Whether the *Brabazon* 2 will ever go into service is anybody's guess, but if it raises as large a storm of controversy as the present *Brabazon* 1, it is quite conceivable that construction of the prototype will never be completed.

The Bristol 175 "*Constellation*-replacement" is intended for service in 1953-4 and a production order for 25 is in the offing. The first prototype will probably be completed late this year and will be powered by four Bristol *Centaurus* piston engines, as will be the first two or three production aircraft. However, the type intended for service on the air routes will use *Proteus* turboprops with which it is expected to have a range of 2,300 nautical miles at 29,000 feet.

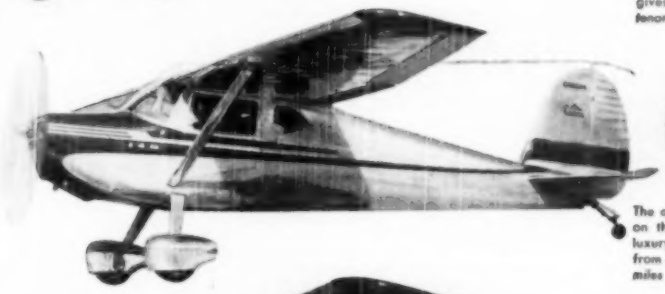
A rather interesting point made by the British aviation publication *The Aeroplane*, recently, was that when B.O.A.C. takes over its Bristol 175's, there is the prospect of having eight different types of aircraft in service with six different engine types. Headaches over maintenance and spares problems are likely to be very numerous in the mid-'50's. END

★ DESIGNED TO PAY FOR THEMSELVES... AND MORE! ★



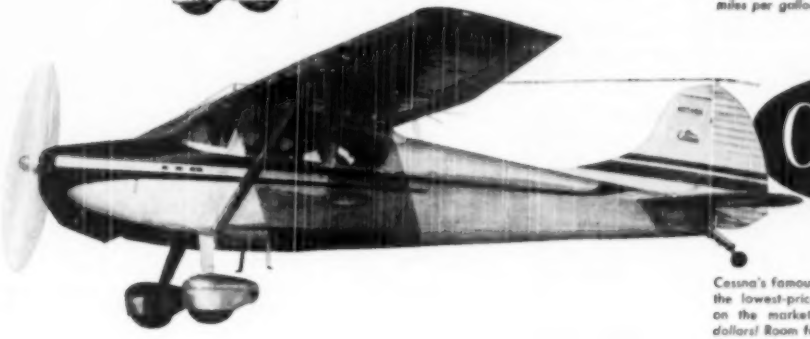
Cessna 190 and 195

The practical personal airliner. All-metal, 4-5 place. Airline-type engines. Your Cessna Dealer will be glad to show you that the 190 Series Cessnas give you shorter take-off, more speed, more range, more load and more comfort. By far the roomiest, most luxurious plane in its class—yet Cessna engineering gives you *extremely low operating and maintenance costs.*



Cessna 140

The only low-priced, all-metal 2-place plane on the market! It offers more room, more luxury features . . . and efficiency formulas from all over the U.S.A. *prove it delivers more miles per gallon, more speed, more range!*



Cessna 170

Cessna's famous "Family Car of the Air" . . . the lowest-priced, all-metal, 4-place plane on the market today *by several thousand dollars!* Room for 4 large men with luggage. Over 120 m.p.h. cruising speed. Over 15 miles per gallon of gas.

Pick Your Plane...From These All-Metal Cessnas

THERE'S ONE THAT FITS YOU... AND YOUR POCKETBOOK!

Take a good look at your business... *and yourself.* Then visit your Cessna dealer.

He's prepared to show you—with facts and figures and by practical test—that there's a Cessna which will more than pay for itself in your business and add extra pleasure to your life.

For example, on an average 1,000-mile trip in the U. S. A. the 2-place Cessna 140 will get you there within an hour of DC-3 airline schedules. And with the Cessna 170 and 190-195, you can *beat* DC-3 airline schedules!

Yet all of these fast, luxurious Cessnas are also engineered for the simplest possible maintenance, the most economical operation plus great stability and ease of flying. You'll be amazed when you see the figures.

Think what this increased mobility—this ability to go where you want, when you want, quickly *and economically* can mean to you and your business! Think of the competitive advantages it will give you.

Only Cessna can produce such values because only Cessna builds a complete line of all-metal personal planes.

See Your Cessna Dealer Today... Arrange for a Practical Test

USE THIS COUPON

Cessna Aircraft Co.,
Dept. F-2, Wichita, Kansas

Please send free literature giving complete description of the Cessna 140 ( ); Cessna 170 ( ); Cessna 190, 195 ( ); Literature for model builders ( ).

Name.....

Street.....

City.....County.....

State.....Phone No.....

Chief Pilot Notes

(*Continued from page 17*)

Localizer Operation

Ignition noise can influence the reading you get on the localizer needle.

● So can corona, charged precipitation, and the radio transmitter if it's on.

Wet Runways

We all know brake action on wet asphalt and concrete is poor. The answer: use the first part of the runway.

Airports Without Towers

1. Don't make 180° turns on the live runway.

2. Don't taxi on the runways if taxi strip is available.

3. Make at least 180° turn in the traffic pattern before landing.

Carburetor Ice

Emergency maneuver with iced-up engine: turn the switch off and hold down the primer and booster and the engine selector switch. Keep this in mind for possible emergency use, as it will usually take the ice out. (It insures backfiring.)

Cloud Top Skimmers

You are much safer well above the tops.

Ultra-Violet Rays

The Plexiglas used in the cabin and cockpit windows of the DC-6 does not filter out ultra-violet rays. Watch the sunburns. (This is a useful thing for passengers to know, as well.)

Flight Problem

Pilot X departed from Detroit airport during thunderstorm conditions, at night. Altimeter read zero for two minutes, airspeed 90 m.p.h. (DC-3) for same length of time. Blinding rain, pilot unable to tell whether or not he was clearing tree tops.

● There are several things here to notice. In a heavy rain you cannot see forward out of the windshield. When you are cruising en route and it begins to rain, you may think that you are CFR, flying visually, but you are not. You won't be able to see another airplane coming toward you in time.

Altimeters are very peculiar during accelerations and decelerations. The static vents seem to be affected by the changing air flow and resultant air pressures; they seem to have a lag in the job of equalization. The next time you take off, note that when you are gaining speed the altimeter will go down, and you may be as much as 200 feet up with it reading zero. The result is that, if you go blind on the take-off, you will think that you are not gaining altitude and your tendency is to pull the nose up higher and be in danger of a stall. It is very hard to resist this feeling.

The opposite case is even more serious, if you are making a blind approach. In deceleration the altimeter will read so that it tells you that you are much higher than you really are. Suppose you have an airplane like a DC-6. You are approaching with a good margin of flying speed. When you put down the landing gear you slow down; when you put down the flaps you slow down. You glance at the altimeter and then go back to your ILS or, if on GCA, to your track and glide indicators, the directional gyro or gyrosyn, and the climb indicator on which you have to concentrate. You may be 150 to 200 feet lower than your altimeter tells you that you are; you may be much too low and not know it.

Then, when you are getting very close, you may slow down from, say, 150 m.p.h. to 130 m.p.h. by retarding the throttles. With the drag of the gear and flaps you may make that slow-down rather quickly, and the altimeter will show you that you are much higher than you really are. A safe pilot must allow for the false indication of the altimeter during decelerations.

Yet it is amazing how few pilots and CAA officials know the truth about this. The reason that they don't know is not hard to find. When coming in by eye in good weather, the pilots are not looking at the altimeter; there is no need to. They are looking out for traffic and watching the runway that they are going to land on. On the other hand, in bad weather they are blind and they don't know that the altimeter is lying to them. On the ground the altimeter will check all right.

On all blind approaches try to keep your forward speed fairly steady until you are in sight of the ground. This is not always easy to do for in gusty air you need excess speed, as you do also in wind gradients, in order to protect the airplane. You are caught between the altimeter and the chance of overshooting. The only thing you can use is judgment or a little more altitude; of the two a little more altitude is the more dependable.

A lot of mysterious crack-ups were caused by not knowing these facts.

Precipitation Static

You will have only an eighth of the static at 150 m.p.h. that exists at 300 m.p.h

ILS

Snow has the tendency to steepen the glide path.

Always ask for GCA assist when making an ILS approach, if it is available, as a double-check against your ILS instrument accuracy.

● This can be vital in the case of altimeter aberrations mentioned previously.

Landing Lights for Safety

The more lights you have burning in the vicinity of an airport, the better the other fellow can see you.

Ice on Wings

A DC-6 attempted to take off at Los Angeles; wouldn't fly with some ice and snow on the wings. No damage. Be sure the wings are clean before starting take-off. It doesn't take much to disturb wing efficiency on high-speed planes.

Chick Sales

In case a passenger gets locked in the Chick Sale (that's the admiration room, you know), our DC-6's are equipped with a screw located directly under the "Occupied" sign. The use

Operators *Too* Praise AOPA!

"We appreciate the good work the AOPA is doing for the promotion of private flying and try to do everything within our power to give the kind of service pilots like to receive and which they as customers are entitled to."

S. L. Stuckey, AOPA 31434
Ruston, Louisiana

Not only pilots—but fixed base operators too appreciate the outstanding job AOPA is doing for the advancement and promotion of private flying. From coast to coast hundreds of these operators—men with a heavy investment in the future of private aviation—have joined the membership of AOPA because they know that this largest and most powerful of all private flying associations gives its members safer, better, cheaper and more trouble-free flying. They know that this kind of united leadership means progress. They know that AOPA wages a continuous and highly effective offensive against the short-sighted and selfish interests that would complicate and curtail private flying.

Service has long been the first rule of AOPA—service that pays off in the air—on the ground—service in the courts, at your home base, cross country—or any other place a member needs it. This same spirit is reflected by AOPA fixed base operator members. From coast to coast these men not only rely upon AOPA for guidance and assistance but stand ready to deliver a full measure of service whenever called upon. These men are part of the greatest organization in private aviation—*your* kind of fliers themselves in *your* kind of an organization.

Join today. Your $5.00 membership fee will bring you more pleasure, more safety, more service. A partial list of membership advantages is shown below next to your membership coupon. Use it today.

Valuable AOPA Services FREE to Members

The Washington staff of AOPA will help you in personal flying problems, licenses, regulations, legal tangles, documents, plane sales and purchases. Also national AOPA-Hertz Driv-Ur-Self courtesy card; AOPA Washington Newsletter; each month the special AOPA edition of FLYING magazine; TWA-AOPA courtesy card assuring service and maintenance facilities at most TWA airports, advantageous aviation insurance service; distinctive AOPA pilot's wings, emblems for your plane and car, and membership card. Above all else, AOPA continuously protects and fights for your flying interests in government and other circles.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION
National Headquarters, Dept. F-450
Washington Bldg., 15th and N.Y. Avenue, N.W.
Washington 5, D. C.

I first soloed on airplane at ..... in the year .....
I own aircraft NC..... Make.....
I hereby apply for membership in AOPA.
I was previously an AOPA member.....
My registration number was .....
Enclosed find check or money order for .....
(U. S. A., Canada, Mexico, Central & South America, $5.00. All other Foreign, $6.00.)
NAME..... Please Print
ADDRESS.....
CITY & STATE.....
PILOT LICENSE NUMBER.....
SIGNATURE.....
$1.80 of each year's dues are for my subscription to the AOPA Edition of FLYING.

"AOPA"
AIRCRAFT OWNERS AND PILOTS ASSOCIATION

PILOTS

INCREASE YOUR EARNING POWER!
Get Your
INSTRUMENT and AIRLINE TRANSPORT RATING Now

Train at AMERICAN FLYERS—the world's largest Instrument and Airline Transport School—and insure YOUR future in aviation. American Flyers has trained more pilots for the Airlines than any other school in the country—MORE THAN ALL OTHER SCHOOLS COMBINED!

If you want the most modern and efficient flight instruction—whether you are a veteran or civilian pilot—write to us for our free booklet outlining the courses we have to offer.

VETERANS—Your certificate of eligibility from the Veterans Administration is all you need to enroll at government expense for any of our courses under the G.I. Bill of Rights!
Courses start at any time—no waiting!

Now you can obtain a H.P. or TYPE RATING on our DOUGLAS DC-3s under the G. I. BILL

AMERICAN FLYERS

MEACHAM FIELD FORT WORTH 6, TEXAS

MAIL THIS COUPON TODAY

Please send me FREE Booklet and data on
☐ INSTRUMENT ☐ CIVILIAN
☐ AIRLINE TRANSPORT ☐ VETERAN

NAME_____

STREET_____

CITY_____ STATE_____

IT'S A FACT!

Cessna Installation

MORE NARCO UNITS ARE SOLD THAN ANY OTHER MAKE!

The Narco Antenna has become a familiar sight on personal and executive airplanes all over the country. That's because **more and more,** plane owners and pilots are learning from enthusiastic users that Narco is **the completely dependable** VHF transmitter-receiver and Omni equipment. That's why more Narco units are sold than any other make.

Narco is the **only** VHF and navigation set that complies with or exceeds all requirements of CAA Specification ES 63B. For static-free communication, navigation, and ILS localizer approach equip your airplane with NARCO OMNI—you'll get the best dollar for dollar value, that most tubes per dollar, and the least pounds—**you'll get it best for the least!**

See your authorized dealer for a demonstration and immediate delivery.

West Coast Representatives

THE LEE SMITH CO.

6363 Wilshire Blvd. Los Angeles, Calif.

narco

NATIONAL AERONAUTICAL CORPORATION

WINGS FIELD, AMBLER, PA.

of the pilot's tool kit screw driver to turn this screw will unlock a locked door from the outside.

Too Low on an ILS Approach

A captain with 20 years flying got too low while making an approach at Chicago. No damage. Might have been another time.

The altimeter setting was 27 minutes old and set at 805; the correct setting was 830.

Station altimeter error approximately	30 feet
Altimeter lag due to fast descent	50 feet
Change in pressure, .03	25 feet
Ship's altimeter off approximately	30 feet
Total	135 feet

Slightly below 300 feet, say 280 feet, minus 135 equals 145 feet, the height of an obstruction near the glide path.

● The reader will note that this does not include altimeter errors caused by decelerations and by wind gradients. Nor does it include the influence of pilot lag; a pilot must look from his ILS instrument to his altimeter, note its reading, interpret it, translate the information into action on the controls, and then the controls must change the attitude of the airplane. This is of some significance, especially with fast planes; for example, the glide path with a DC-6 gives about 1,100 f.p.m. rate of descent. Surprisingly fast, isn't it?

Storms

If you are on the ground, wait out a storm. Very few persons have been hurt in a parked airplane.

Lightning Storms

Vertical lightning is a sure sign of extreme turbulence; stay away from it.

Don't fly under a roll cloud.

What Is Par for ILS Approaches

From what we have observed on line and instrument checks over the past two years, two dots high or low on the glide path for the needle displacement, and mid-wing to mid-wing on the localizer constitutes our average pilot ability. Check yourself, then check us on this appraisal. Also for further discussion and study on ILS, our average pilot states that 80 to 90 per cent of his powers of concentration are devoted to the ILS instrument once leaving the outer marker. Therefore, some of our men state that they prefer to let the first officer devote his 80 to 90 per cent energy to that one instrument, while the captain sits back as a monitor with more free energy and thought to the overall picture. Your comments on this are welcome. With the known bend in the CHI localizer, I personally find I can fly a regular GCA run with greater ease than chasing a false localizer indication.

• • •

● Those are all of the oysters of wisdom that it seems would be palatable at present. There were a lot more tips, of course. Some are technical or restricted in significance, such as a change in the location of a switch or the reworking of a solenoid. Some were run-of-the-mine operational pleas, such as don't blow over small airplanes with the prop wash when anyone is looking, be kind to agents, and don't ask too much of the stewardess, such as nine cups of coffee.

Some road apples will no doubt be heaved at your shy reporter. He will doubtless enjoy—again that is the right word—some sharp criticism for mentioning any items of truth.

I should like to add a little tip of my own. Of course, if it were not for egotism, who would be a father? But just the same, an airplane is another situation. In an airplane the dumbest thing that you can do is to think that you are smart.

Don't be smart. Be modest. Just like me. END

Seaplane X-C

(*Continued from page 20*)

some of our shorter hops, the longest then becoming 425 miles in length.

Bill and I are both employees of the Boeing Airplane Company, and began planning our vacation in February, 1949. At that time, Bill was just finishing a private course and I was in the final stages of a GI commercial course and was getting a seaplane rating.

We both had families in the East that we wanted to visit which was an excellent reason for a cross-country. However, we wanted the trip to be a bit different from an ordinary X-C, and the seaplane was the answer.

When vacation time finally rolled around, Bill had acquired his private license and 100 hours and I had worked up to 275 and an instructor's rating. Thus equipped, we took off from Seattle's Main Seaplane Base at 5:30 p.m. on June 27, and crossed the Cascade range to Coeur d'Alene, Ida., 275 miles away, by dark.

Last-minute delays in converting and relicensing the plane had postponed our start three days, and with other minor delays and a one-day stopover in Chicago on July 1, we were way behind schedule. Our Dayton visit with my family, a short bus ride from the Ohio River at Cincinnati, was cut short and we reached Baltimore after dark on July 4.

I left the plane there and Bill took it on a moonlight solo to North Carolina, landing on the bay in front of his home in Manteo at 3 a.m. His family reunion was interrupted half an hour later by the arrival of the sheriff, who was looking for the crash reported by neighbors hearing the engine quit 10 miles from the airport.

On July 7 I took an airliner to Elizabeth City, N. C., where Bill met me with the Luscombe. We maintained a tight schedule from there on, and after a two-day stopover in San Francisco arrived back in Seattle on July 14, 17 days after our departure. We flew a total of 90 hours, averaging 5 hr. 18 min. of flying every day.

Our average cruising airspeed was 88 m.p.h.—rather slow for 85 h.p., but the floats cut about 10 m.p.h. from landplane speeds while the change to a lower-pitch prop improved take-off and climb at the cost of an additional 10 m.p.h. At times, headwinds cut our ground speed to the point where cars on the highways below were passing us.

Our costs were very reasonable. Our accommodations ranged from the Stevens Hotel in Chicago to YMCA's, and we ate everything from sirloin to hamburger. Total expenses for the plane were only $162 (or $4.76 each per day) which included gas, oil, tiedown and landing fees where they were charged, and a new coil and rework for a rough magneto, our only mechanical trouble.

Daily personal expenses are harder to average because of visits with friends and families, and accompanying expenses entirely unrelated to travel. However, for travel days we found that $7 each covered meals, hotels, transportation from moorings, and such incidentals as tele-

"I Joined the Air Force to build a Career"

The new Airman Career Program develops skills for lifetime careers.

Airmen enjoy ample free time for sports and recreation, 30 days annual vacation with pay.

An Airman is a career man, with opportunities for advancement, security and success.

Where else can you find such opportunities as you're offered in the new Airman Career Program!

As an Airman you're on your way to a real career. Scientific aptitude tests reveal your strongest abilities. Then you are expertly trained, either on the job or in the world's finest technical schools, for one of the 400 job specialities in the many Airmen career fields —with full pay from the start. You have many opportunities for education, advancement, security, and the good things of life. Inquire about the Airman Career Program at your nearest Recruiting Station.

U. S. AIR FORCE

VISIT YOUR U. S. ARMY AND U. S. AIR FORCE RECRUITING STATION

grams, cigarettes, and magazines. This made a total expenditure of $11.77 each per day, but it must be remembered that this figure does not include capital investment in the airplane, depreciation, insurance, cost of 100-hour inspection, or other overhead items that a commercial operator must consider.

The planning of such a seaplane X-C differs little from that of a landplane trip. The main things to consider are properly-spaced refueling stops and alternates. Any lakes that show up on the aeronautical planning chart are almost invariably large enough to land on, and regional and sectional charts will reveal many more. The Seaplane Facility Directory, available for 25 cents from the CAA, is a must for anyone travelling on floats. It lists all of the known seaplane bases in the country as well as the few prohibited waters of each state.

Of course there is no need to feel apprehensive about being beyond gliding range of water. Actually, the seaplane enjoys a two-to-one advantage over the landplane in the choice of emergency landing spots. Seaplanes have shown many times that they can land without damage to ship or floats anywhere that a landplane of similar size can set down.

With the exception of a few stretches in the Southwest, there was plenty of water along the route. The Western mountains abound in lakes of sufficient size to permit take-offs at altitude, and there are numerous lowland rivers. The Missouri River eastward from Great Falls, Mont., provides an almost continuous landing area, and the jump from Bismarck, on the Missouri, to St. Paul, on the Mississippi, is dry for barely 60 miles at a time. The country east of St. Paul is all seaplane territory, and facilities are to be found on most major lakes and rivers. The East and Gulf coasts, with their sheltered lagoons and the inland waterway, are a seaplane paradise. The overland jump from Galveston, Tex., to the Pacific coast is relatively dry and requires careful planning and map work. The Luscombe made it with five intermediate stops, all of them on the rivers behind dams. The scarcity of lakes and deep rivers in this area is compensated for somewhat by numerous irrigation canals, many of them with straight stretches wider and longer than the biggest airport runways.

With the exception of the Puget Sound area, probably the most seaplane-conscious section of the entire country (Lake Union, in the heart of Seattle, has no less than five commercial schools), West Coast geography does not favor seaplane operations. There are a few excellent bays and inlets, but sheltered coastal water is not generally available, and days when the ocean is calm enough to permit open-water landings are rare. Most West Coast seaplaning is done inland on fresh water. From Santa Barbara, where the only open-sea landing of the entire trip was made, the Luscombe flew to San Francisco Bay, and from there to Seattle, by the inland route because of the greater number of suitable landing areas available.

Mooring was never a problem. Low docks, ideal for seaplane use, were found wherever small boats operated. In most other places, suitable beach was available. Determining wind direction for take-off is no problem to the seaplane pilot, who merely lets the ship weathercock. For landing, the direction is almost as easily determined.

Except in wide-open flat country, surface winds on rivers are generally straight up or down stream, while small lakes are their own indicators. If the wind is strong enough to influence landing direction, there will be a glassy slick along the upwind shore, and the water will be roughest at the downwind end. Larger bodies of water will indicate wind direction by wave action and wind streaks, and small boats anchored or moored to buoys will point into the wind.

Admittedly, refueling was not always as convenient for the seaplane as it would have been for a landplane. The usual procedure when away from seaplane facilities was to circle the nearest airport. The sight of floats overhead made the next move obvious, and someone from the airport was soon on the way to the river or lake in a car. The alternative to this was to beach the seaplane at the edge of town and hunt the nearest telephone. These gas stops seldom exceeded an hour and a half, including time for meals and a visit to the airport.

Very little equipment was carried that would not be taken in a landplane on a similar trip. We did not take a bilge pump but used a sponge instead. It was slower—about a pint per squeeze—but was more thorough and infinitely lighter. Two mooring ropes and a canoe paddle were carried, but no anchor. Maps consisted of point-to-point strip maps, essentially regional charts drawn to the scale of sectionals, and were entirely adequate in most cases. Exceptions were desert areas where check points were almost non-existent and in the area immediately southeast of Chicago where the web of roads and railroads, combined with near-minimum visibility resulting from haze made pilotage from such a map impossible. We turned back after take-off from the seaplane base at Chicago's Navy Pier and bought a sectional, but even then we relied on the beam to steer us out of the area.

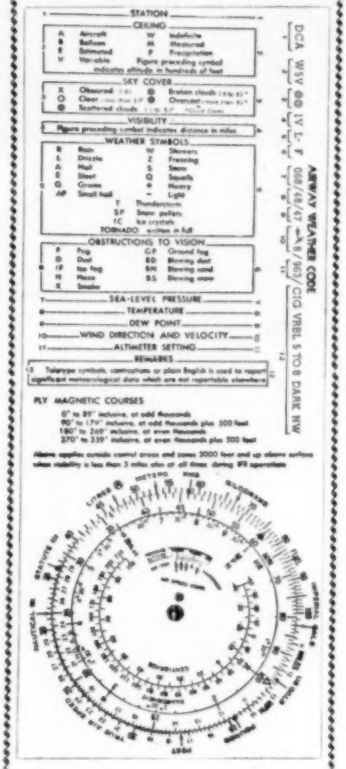
This was one of the few times that we used the radio for navigation. Its major function was to supply weather data from the half-hourly CAA broadcasts. Most navigation was strictly pilotage. We used the compass mainly as a check on the courses of rivers and roads. Beam flying was resorted to only over desert areas or other spots where pilotage was difficult, and on a couple of the night hops, mainly because our route paralleled water courses more often than airways.

One of the most useful pieces of equipment aboard proved to be the rate-of-climb indicator. In the mountains, it showed which side of a valley or pass had an updraft long before we could detect it in the slowly-accelerating seaplane, but it was over the 200-mile stretch of the Mojave Desert that it paid off. The 110° air was extremely unstable, and most of it seemed to be settling, since a constant descent of 100 feet per minute registered at cruising r.p.m. However, rising air

COAIRDINATOR

ONE OF SEVERAL new computers designed to simplify flight planning and cross country navigation for lightplane pilots has been introduced by the Halpin Coairdinator Company, P. O. Box 65, Lambert Field Branch Post Office, Lambert Field 21, Mo. Halpin began flying with the Air Corps in 1922 and has wide experience as a pilot.

The Flight and Route Plan Coairdinator illustrated below provides a circular slide rule for solving problems of time, fuel consumption, speed, and conversion



units of measurement. It also includes a code analysis plan for reading teletyped weather reports.

The reverse of the side pictured gives all information necessary for filing a flight plan and provides a handy form that the pilot can use during flight, filling it out with the necessary flight plan data. It also includes scales for use with regional and sectional aeronautical charts for a direct reading of ground speeds, time intervals, off-course errors and route planning. It has a 24-hour clock face in addition. The price of the Coairdinator is $2.50.

was to be found under frequent cumulus clouds, though the most likely looking did not always produce the most lift. The R/C soon detected the best ones—some carried the Luscombe up at a rate of 1,200 feet per minute!

Considering the length of the trip, we encountered very little adverse weather. The main trouble was the summer heat. From Polson, Mont., on around to Needles, Calif., the temperature was generally 100° and was accompanied by an almost complete lack of wind, at least at our take-off points. This resulted in glassy water, a strike against a seaplane anywhere, in addition to which we had the occasional handicap of high altitudes and near-maximum loads. This compounding of unfavorable conditions twice resulted in the trip becoming a solo affair.

At Polson, elevation 2,900 feet, the Luscombe would not get off with two aboard, so I took it across the Continental Divide and on to Bismarck solo while Bill caught up by train the next day. The other solo hop was from Elephant Butte Lake, on the Rio Grande in New Mexico, elevation 4,500 feet. Bill took a bus to Albuquerque, where he was to catch a train to Needles. Just on a hunch, he went out to the airport to see if he could catch a ride and there he found a pilot who was looking for someone to keep him company all the way to Sacramento, Calif., in a Luscombe *Sedan!* I spent several hours in the 105° shade of the Needles Riverview Airport waiting for him before getting the message that he would meet me that night in San Francisco.

Other than heat and calm for take-off, the weather proved troublesome on only one occasion. The weather reports on the radio invariably gave high ceilings and favorable conditions at points along the route. What I failed to do was to interpret the readings of off-route points properly, and to locate them on the map, with the result that I got caught in violent frontal conditions originating over the desolate Missouri River badlands between Fort Benton and Fort Peck reservoir.

The storm seemed to materialize overhead like a suddenly-opened umbrella, with the Luscombe right in the middle. The intensity of the gusts made any kind of a landing extremely hazardous, and since the weather ahead seemed no worse than that which had closed in behind, the plane and I kept on going, thankful for the light solo load. The only other weather encountered was an occasional rain shower that we easily detoured. We had expected to find most of our turbulence in the mountains but it was the desert and prairie areas that gave us our roughest rides.

We flew over just about every kind of terrain that the country has to offer, and saw much more of it than either of us had seen in several surface trips. If we were doing it all over again, we would make only one change, and that would be to a slightly larger plane. For a trip of such duration, the compromise between two weeks of suitable wardrobe and the gas load comes out unfavorably for the wardrobe when gas stops are 300 miles apart. END

For Your Aviation Mechanic Training

Look to

ARLINGTON AERONAUTICAL SCHOOL
ARLINGTON, WASHINGTON

★ **You can receive both your AIRCRAFT and ENGINE MECHANIC LICENSES in 12 months. Theory classes are held to a minimum, you will receive the majority of your training in the practical shops. (Learning by Doing.)**

★ Housing facilities are no problem at Arlington. We have apartments available for married students and bachelor quarters for the single students at a nominal rental.

★ Investigate the possibilities of a future in Aviation. Write today for full information. Receive your training in the Great Northwest. Enjoy Washington recreation. Boating, skiing, hunting, ocean and lake fishing and other entertainment.

★ **ARLINGTON AERONAUTICAL SCHOOL is approved by Civil Aeronautics Administration, Washington State Board of Education and Veterans Administration. Veterans may receive their training under the G. I. Bill (Public Law 16 and Public Law 346).**

ARLINGTON AERO. SCHOOL, Box 86, Dept. G, Arlington, Wash.
Please send full information immediately.

Name ..... Age .....

Street Address .....

City ..... State ..... Veteran (yes or no) .....

The AF Reserve

(*Continued from page 31*)

"boss" lowered the boom. President Truman told the Air Force to get a more vigorous training schedule for its civilian members.

Almost immediately, one of the Air Force's great tactical minds, Lieut. Gen. E. R. Quesada, was made head of the USAF Reserve Forces. One of his first moves was to change drill procedure. Instead of meeting once a week for two hours, organized units began to meet one full week-end a month—thus performing a total of 16 compact hours compared with the former thinly-spread eight.

Then Quesada and his staff set to work to reshuffle the entire set-up. Except for instrument and transition purposes, training-type planes went out. In came more tactical aircraft. In some instances, reservists were to get a shot at the latest products of the assembly line but in most cases the "tactical" aircraft were of World War II vintage.

The size of the organized force was increased. Criteria for earning promotion and retirement points for volunteer as well as organized personnel were established.

There is still a shortage of equipment. That's to be expected. Even the regular Air Force screams it hasn't enough planes, guns and spare parts. Since George Washington and his men weathered that bleak winter at Valley Forge, American armed forces have persistently registered that complaint.

All in all, however, the Air Force reservist can now join and work with pride in an outfit which in many respects resembles the one he worked with in World War II. Less than a year after the new plan went into effect, personnel are close to filling the complement in many areas, and new, eager units are being established weekly.

A number of the old reserve fields and units were shut down last June. Many more, however, were authorized and have been opened since that time. All of these are connected with the "organized" part of the program.

The organized reserve is composed of three sections, within which some 71,300 reservists are programmed for active and inactive duty training with pay in positions of every conceivable MOS (Military Occupation Specialty). The three components are:

Mobilization Assignment. The category is open only to officers. Participating reservists receive "on-the-job" training (in respective MOS) at a regular AF unit, detachment or squadron. A third of the assignees are in the general and field grades.

The assignee must put in 48 training periods of at least two hours and 15 days annual training duty. For his training, he is paid and receives retirement and promotion credits. The title of the category indicates that the reservists are actually training in the job they will take over on M-day. AF reservists in this category totalled 12,675 on January 1, 1950.

AFRTC Program. Someone with a vivid imagination tabbed this activity, open both to officers and airmen, with the phonetic label of "AFTRAK." The real initials stand for Air Force Reserve Training Center, 23 of which are established throughout the nation in heavily-populated areas. Each center gets 16 tactical-type aircraft plus some trainers to support a Training Wing. (Long Beach, Calif., and Chicago, Ill., get 32 tactical aircraft each to support two wings.)

A wing is comprised of four squadrons and supporting units, each squadron meeting on a different weekend during the month. The 25 wings divide into five light bombardment wings using Douglas B-26's and 20 troop carrier wings, three using C-47's and 17 using C-46's.

AFRTC participants must attend 48 inactive duty training periods and take 15 days training duty per year, for which they are paid and get retirement and promotion points. Those with flight orders are allowed up to 80 hours per annum on a reserve-wide average.

"AFTRAK" will train 36,155 (10,005 officers and 26,150 airmen).

This AFRTC program supposedly puts 25 reserve squadrons, fully equipped, at the disposal of the high command shortly after M-day, with 75 others ready to go as soon as they are issued equipment. This isn't necessarily what will happen, however. AFRTC squadron personnel may find they will be pooled prior to assignment to regular field units in event of a future war. Actual mobilization plans concerning them are secret.

As in the set-up prior to June, 1949, there are skeleton regular AF active-duty crews at each AFRTC, but maintenance of planes and equipment during operating week-ends is the responsibility of each organized squadron. This gives the reserve airmen plenty of opportunity for training in repair and maintenance.

Corollary Program. This component operates somewhat as a parasite on regular units. It includes a planned total of 300 corollary units of many different sizes. The units have no equipment, facilities or housekeeping problems, depending upon regular AF units to take care of them.

One weekend each month a unit meets at a regular installation and is supposed to take over all functions of the parent organization—flying, operations, maintenance, aerology, etc.

The training is under immediate supervision of the regular organization. For example, at Carswell AFB in Fort Worth, Tex., the reservists never go aloft in a B-36 without some regulars along. (At this writing, no reservist has yet checked out in the big bomber, but it's expected momentarily.) At bases where jet squadrons are the parent organizations, reservists have already checked out in jets under regular supervision.

This program, which offers training to 22,625 (5,219 officers and 17,406 airmen) is the most progressive reserve movement because personnel learn and train with the latest Regular equipment. That includes not only planes but also guns, radar and training aids.

Corollary units not designated as fully organized are allowed only 24 drill periods with pay each year until they hit fully-organized status. All units are expected to perform the same amount of training as mobilization assignees and AFRTC units—48 drills and 15 days training duty each year. Pay and promotion and retirement credits are the same. Rated flying personnel are allowed up to 80 hours flying time a year on a reserve-wide average.

In addition to the "Organized" reserve, a "volunteer" section is composed of Volunteer Training Units offering training to an estimated 60,000 individuals. This does not offer pay as an inducement to participation, but does give promotion and retirement credit.

Volunteer Training Units. These are made up of officers and airmen, who, at the flight level, have the same MOS. Each unit meets regularly, generally once a month, for lectures and training in the respective specialty. Ten reservists, at least two of whom must be officers, are required to form a unit.

Better than 1,200 units are now in existence. (*Continued on next page*)

"Doris? Elaine? Florence? . . . Miss Davis?"

Extension Courses. Approximately 160 correspondence courses covering many pertinent AF subjects are open to all reservists, organized or volunteer. The airman, generally speaking, can take only one of a half-dozen groups of the courses, but he still has enough to keep him busy for a number of years. Points toward promotion and retirement may be earned through this program.

The extension course program parallels, insofar as it is possible, the Air University school system. It offers AU-type training and opportunities for learning and advancement to both Regular and Reserve members of the AF. It aids the reservist who is prohibited geographically from attending organized drills. The AF expects to enroll some 75,000 reservists in this program.

The President's interest insures the present ambitious training program of even greater activity and support in the future.

Changes will be made as the current program develops and experience dictates. Regular AF personnel who know that a strong Reserve could be the deciding factor in a future war, are cooperating as much as possible with the training program. Their effort indicates that the USAFR will become more integrated with the regulars as time passes. END

Douglas Skyraider

(*Continued from page 19*)

in the AD series was a long one. It came about through a top Navy decision to simplify carrier armament by making one airplane do the jobs formerly done by several models. This, it was considered, would increase carrier air group efficiency. The specialized models could stay at home and be replaced by the new all-purpose airplanes. It would reduce the spare parts and maintenance problem, and would cost only one-fifth as much to develop an airplane to do five jobs as it would to develop five airplanes to do the same five jobs.

Design work on the AD started in June, 1944, just eight months prior to the first test flight. Original Navy contract specifications required an improvement in all phases of performance over previous attack airplane types. Douglas engineers went the Navy one better and gave them a prototype airplane 2,000 pounds under original specification requirements. This weight-saving immediately increased the AD's maximum armament load by an equal amount. Maximum lift coefficient was increased from 1.8 to 2.0 by departing from the modern trend of high-speed 65 series airfoils in favor of a higher maximum lift section of the NACA 2400-4400 family. Improved utility of the airplane was obtained by design that reduced refueling, arming, and maintenance time by 50 per cent over previous attack types.

Exactly nine and one-half months after the contract was let, the first AD, its preliminary demonstration completed, was on its way to the proving grounds at Patuxent River, Md.

Since then, some 20 versions of the

AERONAUTICAL UNIVERSITY

• You will make no mistake in choosing Aviation for your future career. Tremendous opportunities are in sight—and those who are best trained will get top positions.

Prepare for your entrance into key positions in Aviation at one of the oldest recognized aeronautical schools in the country. Courses in:

21st YEAR

• AERONAUTICAL ENGINEERING
• AIRPLANE AND ENGINE MECHANICS (Approved by Civil Aeronautics Administration)
• PRE-ENGINEERING
• AERO. ENGINEERING DRAFTING. (Tech. Inst. curriculum approved by Engineers' Council for Professional Development.)

APPROVED FOR VETERANS' TRAINING

Founded by Curtiss-Wright. Outstanding faculty, modern equipment. Day, evening classes. Placement Service. Member of the National Council of Technical Schools.

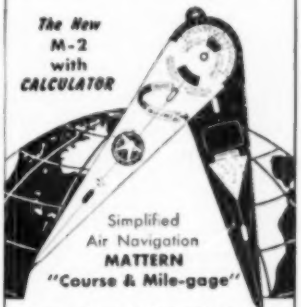
AERONAUTICAL UNIVERSITY
Dept. 20, 116 South Michigan Avenue, Chicago 3, Illinois

Please send me your free catalog, Opportunities in Aviation, and full information about the following courses:

☐ Aero. Engineering ☐ Pre-engineering
☐ Airplane and Engine Mechanics ☐ Aero. Eng. Drafting

Name .....
Address .....

The New M-2 with CALCULATOR



Simplified Air Navigation MATTERN "Course & Mile-gage"

Accuracy and simplicity have made the Mattern COURSE & MILE-GAGE a navigational essential for thousands of pilots. Direct Mileage Readings on air maps. No searching for scale. Headings, Turns, and Corrections in seconds—without computation. Made of heavy-duty, engraved, satin-finish aluminum. Operated with one hand ease.

• ● •

M-1—World, Regional and Sectional Chart Mileages at a glance • Protractor • True Courses • Straightedge • Pair of Dividers • Morse Code • 5-inch Ruler • Cent.-Fahr. Conversion Tables $3.45

M-2—All M-1 features Plus. Calculator on reverse side operated with one hand • Magnetic and Deviation Corrections, all Turns, Reciprocal Headings—without Calculation • Statute, Nautical, and Kilometer Direct Mileage Readings on World Charts • Statute Miles on Sectional Map $4.95

See Your Dealer or Order Direct From
JIMMIE MATTERN COMPANY
1056 East Harvard Road Burbank, Calif.
(C.O.D.'s include mailing costs)

PILOTS
GROUND INSTRUCTORS
PASS YOUR C.A.A. WRITTEN

Use "PRACTICE PROBLEMS FOR PILOT CERTIFICATES" and pass your examinations with ease.

Successful study guides Instrument, Commercial, Airline.

NAVIGATION: PRACTICE PROBLEMS FOR PILOT CERTIFICATES
• Dead reckoning, instruments, charts
• Radio, instrument flight procedures
• Explanations, latest type examinations
• WAC 361 & 25 DF—FREE with each book
• Up-to-date 1950 supplement

METEOROLOGY: PRACTICE PROBLEMS FOR PILOT CERTIFICATES
• 260 Multiple-choice questions by subject
• 75 Weather Map questions—Map FREE with book
• Up-to-date 1950 supplement

MAIL THIS COUPON TODAY

PRACTICE PROBLEMS FOR PILOT CERTIFICATES
1360 Torrance St., P4, San Diego 3, Calif.
Please send ... copies of "Navigation" @ $2.00 and ... copies of "Meteorology" @ $1.00 by E. C. Lambert, A.B., M.S.
Remittance Enclosed ☐ C.O.D. (plus postage)
NAME .....
ADDRESS .....
CITY & STATE .....

AD have been built and delivered to the Navy. These versions are difficult to sort out and classify, and this difficulty only accentuates the original feat of building a basic airplane that, with only slight modifications, can be used to fulfill a number of strategic and tactical functions.

There was the BT2D series to begin with, followed by the AD-1's, 2's, 3's, and 4's. Variations of earlier models were produced in the "Q," "N," and "P" versions. Later models have added Utility and "W" versions. The BT2D's and AD-1's are equipped with Wright R-3350-24W engines, developing 2,500 h.p. without water injection. The AD-2's, 3's, and 4's are equipped with Wright R-3350-26W engines, developing about 2,800 h.p. with water injection. Later model AD's include such refinements as functional cockpits, improved-vision windshields, indirect-lighted instrument panels, and autopilots.

In all these versions there has been no serious alteration in the basic design. In over 90 per cent of all cases, the same tool kit and same spare parts can be used to repair the first or the last of the nearly 600 airplanes that have been delivered to the Navy. And in most cases (except in the special-purpose versions) the same airplane can fulfill most of the tactical functions by merely changing the equipment and armament on its bomb racks.

Basically, the AD is a low-wing, all-metal monoplane, with a span of slightly over 50 feet. It is 15 ft. 10 in. high, and 39 ft. 5 in. long. Weight empty is about 16,000 pounds, and maximum military load (excluding fuel) is 10,000 pounds. The wings fold upward hydraulically, reducing parking width to 24 feet.

Normal radius of action is 750 miles. This can be increased by the addition of external fuel tanks at the expense of armament load. Reliable estimates place the AD in the 400 m.p.h. speed class. The basic airplane is a single-place job, with the pilot acting as gunner and radioman during attack operations. Provisions are made in the special purpose versions, however, for extra crew personnel. The "Q" models require a radar operator in radar counter-measures operations, and the "N" models require both a radar operator and a counter-measures operator. The recently announced "W" versions carry two airborne early warning operators in addition to the pilot. Photographic and utility versions can be modified to carry extra personnel when required.

Important to the AD's versatility was the decision to eliminate the bomb bay and mount all armaments externally. Absence of the bulging bomb bay gives the airplane a sleekness of line comparable with that of fighter airplanes. It has the further advantage that shape and size of armament is not confined to the dimensions of a bomb bay. When other than armament is desired, such as auxiliary fuel tanks, radar packages, or target-towing cable reels, it can be mounted on the external armament racks with a minimum of change and effort. It requires about two hours to modify the AD into a target-towing utility airplane; about 20 minutes to re-modify it into its original version.

Flexibility of armament, made possible by external mounting, is what makes the *Skyraider* equally deadly in dive bombing, toss bombing, general bombing, rocket-toting, night attack and ground support operations. It is only necessary to hang the right "tools" on the bomb racks and go to work. The AD, for instance, could "lay" three 2000-pound bombs on a stubborn shore installation, then return to the carrier deck for a load of rockets to support ground troops sweeping in for the kill. A short while later it could be back with more bombs or rockets as progress of the action demanded.

To illustrate this armament versatility, on extremely long combat missions, the *Skyraider* can carry three 150-gallon drop tanks to supplement its 350-gallon main tank, a full load of ammunition for its two 20-mm. guns, and 12 5-inch *HVAR* rockets or 12 250-pound bombs on its wings. For long-range flight, with a full ammo load and one 150-gallon drop tank on its center bomb rack, two 2,000-pound bombs or two 11.75-inch *Tiny Tim* aircraft rockets can be carried.

But in its most deadly guise, when operating within its normal 750-mile combat radius, the AD can carry two *Tiny Tims* plus a 1,000-pound bomb, or two *Tiny Tims* plus a 21-inch aircraft torpedo with its 600-pound warhead, or three 1,000-pound bombs plus 12 5-inch *HVAR* rockets, or three 2,000-pound bombs.

These figures are more relevant when it is remembered that they approximate the armament capacity of the *Flying Fortress*, the four-engined bomber of World War II!

Let's imagine that Attack Squadron 25, Air Group Two, from the flagship-carrier *U.S.S. Midway*, is attacking an enemy warship. The squadron is armed with 20 *Skyraiders*, and staffed by 20-pilot-officers and 120 enlisted men.

The first action might be release of the squadron's 60 1,000-pound bombs, three from each airplane. Any one of these in a direct hit could disable a warship regardless of its size. Then with body dive brakes flared wide to reduce dive speed from over 500 m.p.h. to under 300 m.p.h. and making for low-level accuracy, the squadron could go "downstairs" and get to work with its 240 five-inch *HVAR* rockets, each with the explosive power of a 5-inch shell. The rockets could be released in "ripple-fire," about 140 feet apart, chasing each other toward the target at 1,500 m.p.h.

The result would be a holocaust far exceeding anything possible from a similar group of airplanes during World War II.

The fuselage dive brakes, used for the first time on a Douglas airplane, have virtually no effect on control of the airplane during a dive. Buffeting is entirely eliminated. Wing lift is unaffected and trim change requirements are negligible. The brakes are excellent for maneuvering during combat, in formation flying, and for quick, smooth let-downs from altitude.

Simplicity of maintenance is important. The smaller SBD had six bullet-proof fuel tanks that required 144-man-hours to remove; the AD has a single fuel tank that can be removed in two hours. The oil system in the SBD weighed 8.64 pounds per gallon of oil; the system in the AD weighs 4.39 pounds per gallon of oil. Weight of the engine mount and cowling on the SBD was 0.154 pounds per h.p.; weight of the mount and cowling on the AD is 0.119 pounds per h.p.

Douglas Aircraft Company's El Segundo plant has delivered between 600 and 700 AD's to the Navy. Deliveries are expected to continue throughout 1951. New explorations into potentialities of the versatile pulverizer promise that even more versions will appear as the program continues. END

FLAT SPINS

● **SO HE DONE IT**
A New York waiter, P. C. White, spent all his savings ($424) on a weekend flight to Ireland, via *Stratocruiser*. On arrival he got a hotel room and went to sleep. Next day he wandered around Limerick and Ennis, then caught the plane back to the States. Said White: "It intrigued me. So I done it."

● **JUST DUCKY**
At Gregg Airport, Longview, Tex., hundreds of wild ducks and geese alighted on a moonlit runway which they mistook for a lake. Three incoming passenger flights had to be sent on to Tyler, and the control tower operator was a nervous wreck for days. "All those birds," he moaned, "and there I sat without a shotgun."

● **HANDYMAN**
When Samuel William Rose saw a plane crash on the opposite side of the River Derwent near Wline, England, he (1) stripped and swam 100 yards across the flooded river, (2) ripped off part of the wing to free the passenger

and pilot, (3) made first-aid splints from pieces of a fence, (4) ran two miles in his underwear to summon an ambulance, (5) helped ambulance aides get the two injured men off to a hospital, (6) went back to his fishing and caught three perch.

The Delta Air Lines people in Atlanta tell this one. A gentleman who apparently had heard of the DC-6's, but not too clearly, entered the ticket office and inquired: "Is this the airline that flies the DT's with the vaporized cabin?"

● **SHOOT IT QUICK**
Humphrey Bogart who plays a jet test-pilot in his latest movie had a hard time keeping up with revisions in the script. When he first read it, the jet had a speed of 900 m.p.h. and a maximum altitude of 50,000 feet. By the time the picture started, those figures had been boosted to 1,100 m.p.h. and a height of 60,000 feet. But the cameras had hardly begun grinding when a new change came through: Bogart's jet was going 1,300 m.p.h. and right on up to 70,000 feet. Said Bogart: "Let's shoot it quick or they'll be having me on Mars!"

—HAROLD HELFER

Russian Photo

(*Continued from page 13*)

generally known, the piston-engined fighters and bombers serve for the normal run of aircrew. Only the politically enlightened—the elite of the Communist Party—are permitted to fly jet aircraft. It has also been stated on more than one occasion that Soviet jet aircraft are not based anywhere west of a line through Moscow. There is no record of anyone having seen a Soviet jet aircraft over Germany, the Baltic, or the satellites down to the Balkans.

Here is a brief description of the LA-11, with a more detailed description following:

HISTORY

Designed by 50-year-old Semyon A. Lavochkin, the LA-11 (identified by painted description on port side of engine cowling) is the latest and perhaps the last of the piston-engined Lavochkin fighters.

They can be traced back through the LAGG-3. The LA-9 is all-metal, very similar to LA-11 but having different position for oil cooler-scoop under fuselage; the LA-11 has integral scoop under nose. The LA-7 was an all-wood, also two-seat trainer/liaison version. The LA-5 was designed to combat the radial-engined German Focke-Wulf Fw-190 and was built alongside inline engine version. The LAGG-3 [see "The Truth About Russian Plane Production," October, 1948, FLYING] was still in production in the Urals in April, 1943, although in service in 1940.

DESCRIPTION

TYPE. Single-seat interceptor and possible long-range, high-level fighter.

DIMENSIONS. Span, 31 ft. 5 in.; length, 27 ft. 9½ in.

POWER. 1,850-hp. twin-row, 14-cylinder air-cooled radial known as ASh-82.

BEST FIGHTING ALTITUDE. 12,500 feet; service ceiling, 34,000 feet.

SPEEDS. 402 m.p.h. at 12,500 feet; with auxiliary wing ramjets, 450 m.p.h.-plus.

COMPARATIVE TYPES. Grumman F8F (*Bearcat* USA); Hawker *Fury* F.B.Mk. 60 (UK); SAAB J-22 (Sweden).

ARMAMENT. Centered on top of motor cowling. Total three heavy machine guns or cannon. Two are on top of port side of motor and third on starboard side. All synchronized to fire through the propeller. Suggested armament is made up of two 12.7-mm. (0.50-inch) Beresin 1,000 r.p.m. heavy machine guns and one (port) 20-mm. (0.787 inch) Sh'VAK 800 r.p.m. cannon.

COLOR. Example which crashed in Sweden was painted light grey overall and highly polished. Identifying markings: *Wings:* National "red (5-pointed) star" with white outline and thin outer black line under each wing. No top surface markings. *Fuselage:* Similar "red star" marking to rear of cockpit. Forward of tail assembly are painted white (black outline) numerals indicating individual unit in particular fighter air division. This gives no clue as to the specific fighter air division or the air force (east, west, etc.)

SANDERS AVIATION, INC. presents

Ercoupe for 1950

New

Trim-O-Matic* With Simplified Two-Control, Improved Sound Proofing, Other Engineering Refinements, Restyled Inside and Out

NOW ALSO AVAILABLE WITH RUDDER PEDALS

It's Still Spinproof!

*In-Flite Lateral Trim and Automatic Centering Control

For Free Brochure, write — Sanders Aviation, Inc., Erco Field, Riverdale, Maryland

FLOTTORP
Armor Coated
PROPELLERS

CUT COSTS

You can save money by equipping your planes with the new Flottorp propeller. The "Armor coated" plastic surface practically eliminates abrasive wear, greatly extends the useful life of the prop, yet the new Flottorp costs no more than ordinary propellers. Write for free folder and price list, or distributor's name.

Stainless Steel at No Extra Cost

Every Flottorp prop has a stainless steel leading edge, and you get this feature at no extra cost. This steel edge, plus the armor coated prop, give you longer wear, greater efficiency, better appearance. Available for practically all planes to 250 h.p. Write for folder and price list.

FLOTTORP
MANUFACTURING COMPANY
World's Oldest Builders of Aircraft Propellers
GRAND RAPIDS, MICHIGAN

INSURE YOUR AIRCRAFT ...BY MAIL

AIRCRAFT OWNERS REQUEST FOR INFORMATION

Name.....
Address.....
Make & Model.....
NC Number.....Year.....
Engine & HP.....
Hangared?.....Where?.....
Or Tied Down, Where?.....
Uses.....
Who Will Fly the A/C.....
.....
.....
Approx. No. Hrs. Flown per Yr.....

NOTE—More detailed information regarding maintenance facilities, pilot experience, condition of aircraft, will help us give you the rate which you deserve.

AERO INSURANCE AGENCY
908 Tower Bldg. Washington 5, D.C.
Management for THE AIRPORT OPERATORS MUTUAL FIRE INS CO of Maryland

in which the fighter squadron is organized. All important maintenance panels, points, etc., are clearly marked by identifying Russian lettering.

DETAILS

TAIL ASSEMBLY. Because of severe ground loop in night landing, tailplane on port side has been forced downwards and curved towards the fuselage. This gives an opportunity for observer to spot large trim tab which breaks slight taper line of trailing edge. Also confirms that although the elevators are of ample area, they are inset to an unusual degree. There appears to be no trim tab on starboard elevator. Buckling of tailplane suggests all-metal sheet covering for the fixed surfaces and fabric covering for the elevators. Goodrich-type rubber boots extend almost the whole length of the leading edge. At the roots pressed sheet fillets are incorporated. Aerial wire for IFF (Identification, Friend/Foe) reaches from tips of leading edges to position on fuselage near radio mast.

FIN AND RUDDER. Unlike tailplane no deicing rubber boot is fitted. Leading edge of metal fin curves neatly into fuselage. Top of fin retains (VHF radio) aerial lead. On earlier Lavochkin models a tiny vertical mast has been mounted on the fin. Because of the damage done to fin it is not possible to ascertain whether LA-11 follows suit. Rudder is of mass-balance type. Confirmation of fabric covering can be seen by examination of lower part of rudder. Two wide horizontal highlights can be seen indicating tightened fabric over rudder ribs. Large rudder hand trim can be seen, which also houses the rear navigation light (thus indicating that LA-11 is regarded as a potential night fighter).

FUSELAGE. Apparently of monococque construction, the LA-11 looks to be of fine finish with flush riveting being the rule rather than the exception. Forward sloping and tapering is the VHF radio mast immediately behind the cockpit transparencies. This, plus IFF terminal and the fact that the D/F loop is situated just forward of the radio mast (in the rear section of the cockpit) indicates Soviet acceptance of standard Western practices. Possible battery lead-ins can be seen just below the rear horizontal point of the "red star" insignia. Unidentified point is forward of the "red star" and under the rear section of the cockpit.

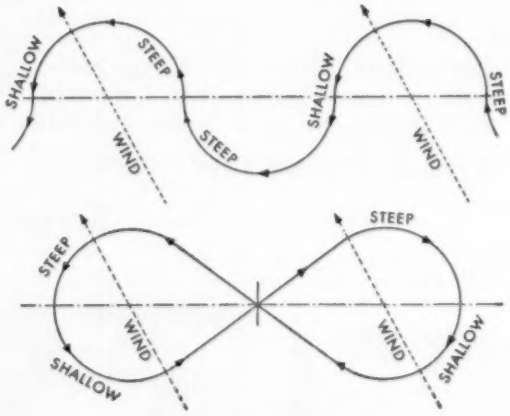
COCKPIT. Unlike earlier 360° vision canopy of the LA-7, both the LA-9 and the LA-11 have rear fuselage backed cockpit. This would seem to restrict all-round vision, though it may have been found desirable in that the LA-11 is a comparatively small airplane. Guide rails can be seen indicating that the hood slides to the rear. In common with current western designs, the LA-11 has a reflector gun sight inside the deep-glass, bullet-proof windscreen.

On top of the windscreen is positioned what has been variously identified as a movie gun camera, a periscopic gun sight and a rear view mirror. The author votes for the first mentioned.

POWER INSTALLATION. A tightly-cowled 14-cylinder ASh-82 twin-row radial of 1,850 h.p. is mounted immediately forward of the wing. Two steel bands hold the quickly-removable main section motor cowl panels. This seems to be an extra precaution as these panels are already held in place by quick-release toggle fasteners, first introduced by German engineers early in World War II to replace the tedious and time-wasting screwdriver method. The leading edge section of the cowling is known to be fixed. This section has the dorsal gun tubes and the ventral segmented oil and air intakes. The exit can be seen immediately below the bent pitot tube. A feature of this motor cowling is that during the severe winter months a camera-shutter type annular plate is fitted immediately behind the large spinner. The ASh-82 drives a metal three-blade airscrew in a counter-clockwise direction.

WING. Like fuselage, wing is of all-metal construction with sheet metal, flush-riveted skin of thin gauge. The wing root fairing is very large and extends to within about a foot of the plan-view centerline. From the lowered position of the split (metal) flaps, the interior of the wing with special reference to the rib spacing can be clearly seen. The fabric-covered ailerons and the split flaps have actuating rods running through the ribs, the rods nearest the trailing edge operating the aileron movement. Straight wing taper is employed on both trailing and leading edges. From the photograph

A FLYING TIP



PRACTICE THOSE EIGHTS

FLYING EIGHTS is one of the best maneuvers for building up pilot techniques and flying skill—if you hold to exact altitude and definite check points on the ground.

There are 57 varieties of eights. The benefits from flying eights depend on how exactingly you do them. The beginner should hold altitude to within 50 feet plus or minus the altitude he is using. Later, depending upon air conditions, he should hold almost exact altitude.

In flying a pylon eight, finding the exact pivotal altitude is most important. First fly straight and level and look out at right angles to the direction of flight. In other words, look over or under your wing. The point where your vision cuts the horizon is the point that should be held on the pylon. It may be a few inches above or below the wing but that is the point which will pivot on the ground.

Make a turn around one of the pylons, being careful not to slip or skid. Then glance at the pivotal point on the airplane. If it is moving ahead in the same direction you are flying, you are too low. If it seems to move back, you are too high. Whichever is wrong, change altitude another 50 feet and try again. When you arrive at an altitude where this pivot point will hold without slipping or skidding, then immediately check your altimeter and tachometer and hold exact altitude and r.p.m.

Since every speed has a different pivotal altitude, it is important to hold it constant. If you pull your nose up on a turn, for instance, you commit a double error: you increase your altitude and decrease your speed. The pivotal position on the wing begins to lag. If you let the nose down altitude decreases and speed increases—which is the opposite of what you need. As speed increases you should have more, not less altitude.

Make your steep turns downwind and shallow turns upwind (see above illustration). Be sure to make the changeover when the plane is directly cross wind or at right angles to the wind.

From "The Spare in Flying"
by FOSTER A. LANE

it can be ascertained that the inner (or center) section of the wing sweeps forward from the outer wing joint to the motor cowling. This is designed to facilitate main undercarriage housing.

Aileron appears to have a fixed metal trim tab. Like the wing shape, the pitot tube under the starboard wing follows the pattern of the earlier LA series. Because of the crushed outer panel it is not possible to check whether the LA-11 has high-speed leading edge slats of the Handley Page variety. Certainly the LA-7, LA-5, and LAGG-3 had them. If they are not installed then it remains a mystery why Lavochkin did not place the pressure head in the wing leading edge. Here it is plainly mounted well back from the lead line.

Another unexplained problem is where the ramjet units are mounted. Careful study of the available evidence makes it appear unlikely that a unit would be mounted as far out as the only visible streamlined housing (rear of "red star") would suggest. From other evidence concerning the LA-9, the correct mounting is immediately outboard of the main undercarriage housing.

In the photograph there can be seen a streamlined and bulged cover on the leading edge, and behind that a small lowered section of the wing. Besides ramjet units, rocket motors have been suggested as being similarly positioned. Either type of unit might be installed for short bursts of high speed for interception. They can be jettisoned. Failing other conclusive evidence, it is thought that the streamlined housing mentioned in the first place is a mounting for a long-range fuel tank. Shadow from the crushed wing hides the wing area forward which might reveal a second and similar mounting.

Final examination of overall wing shape points to it being a single piece structure, whilst the wing tips are of flat curve configuration.

UNDERCARRIAGE. Conventional tail-wheel type, has wide track suitable for small and rough airfields. Undercarriage flaps fixed to the gear itself are in two sections. A third section, covering the remainder of the wheel, is attached to the wing. Probably hydraulically operated main and tail wheel (and also flaps) as in case of earlier versions. The tailwheel is fully retractable and covered by twin doors. There is no evidence to show that the tailwheel is free-swiveling or even steerable. Tailwheel is "doughnut" low pressure shock-absorbing variety in "U" or "horseshoe" light alloy casting complete with hydraulic jack attachment. Main tires are of thin section (high pressure) common on Soviet designs for many years but only now coming into wide use in the U.S.A.

REMARKS. One interesting clue to the type of engine is presented by the long black streak of oil which has been swept down the wing root and on to the rear fuselage as far back as the figure "8". Because of the wing positioning it becomes a simple matter to trace the type of exhaust exit to the ASh-82. This type has seven closely packed exhaust stubs protruding slightly from the rear end of the cowl (on the fuselage) in the manner of the *Bearcat* cowl. Oil has seeped out from this opening and had been forced down in this fashion by the slipstream from the counter-clockwise-turning propeller.

EVALUATION. From the foregoing description it can be clearly stated that as far as the design of piston-engined fighters goes, the Soviet aircraft industry seems in no sense inferior. And in respect to jet fighters, the Russians have been at the game as long as have western aircraft manufacturers, designers and technicians.

The use of a powerful engine in a small (31 ft. 5 in. span) airplane lends potent voice to the reasoning that the LA-11 must have good speed, an all-round agility in the acrobatic stakes, and a reasonably slow landing speed (large flaps) and fast climb. Two doubtful characteristics are the placing of the armament in the cowling, demanding synchronization, and the rear fuselage cockpit canopy (restricting all-round vision).

Otherwise the evaluation is that the LA-11 is a workmanlike offensive day and night fighter bomber designed for maintenance "in the field." END

Photo Credits

The following list shows the sources from which pictures in this issue were gathered. Where a single page is indebted to several sources, credit is recorded left to right, top to bottom:

4—DOUGLAS AIRCRAFT CO.

6—THEODORE BAXTER, CONTINENTAL, INC.

8—AVRO CANADA, WILLIAM GREEN

11—PLANET NEWS, LTD.

12, 13—DOUGLAS ROLFE

14, 15—MARTIN BOYEY, JR.

16—AMERICAN AIRLINES

18—DOUGLAS AIRCRAFT CO., USN, GILBERT C. CLOSE

19—DOUGLAS AIRCRAFT CO., ACME, DOUGLAS AIRCRAFT CO.

20—MAP BY HAL MORRIS, PETER M. BOWERS

21—WILLIAM T. LARKINS, PETER M. BOWERS

22, 23—NACA

24—CHARLES E. BROWN

25—CHARLES E. BROWN, CHARLES W. CAIN, CHARLES W. CAIN, BRITISH INFORMATION SERVICES

26, 27—T/SGT. JOHN H. SCHUFFERT

28—LOU MASS, BOB DOWNIE

29—LOU MASS

30—EDMUND SWIATEK

31—DEPARTMENT OF DEFENSE, USAF

32—USAF

33—NORTH AMERICAN AVIATION, KEYSTONE, HOWARD LEVY

34—CHARLES E. BROWN, BRISTOL AEROPLANE CO., J. BRANCH BRIGGS

35—WRIGHT AIRCRAFT & PINANCE CO., BRITISH INFORMATION SERVICES, HOWARD LEVY, HOWARD LEVY, AEROCAR, INC.

36—HOWARD CLIFFORD, PAULINE M. DYER

38—RYAN AERONAUTICAL CO.

40—DEL ANDERS, OLIVER STEWART, HIDEYA ANDA, FLYING MAGAZINE

42—BILL TERRY

44—BOEING AIRPLANE CO., A. B. ELLIOTT

46—CHARLES BAILEY, RAYMOND SUTS

48—WILLIAM GREEN

52—HALPIN COORDINATOR CO.

56—BRAD PENDLETON

58—FOSTER A. LANE

60—JULIAN S. KRUPA, PAUL E. MACCREADY, JR.

Pratt & Whitney Aircraft
AIRPORT DEPARTMENT

Rentschler Tower
Calling . . .

AIRPLANE
OPERATORS
PILOTS
OWNERS

No one can service the parts of your aircraft quite as well as the original manufacturer. The AIRPORT DEPARTMENT of Pratt & Whitney Aircraft at Rentschler Airport offers you its extensive modern facilities for the

- **OVERHAUL**
- **REPAIR**
- **MAINTENANCE**

of your

PRATT & WHITNEY ENGINES

HAMILTON STANDARD PROPELLERS

Best Because:

1. **Only Pratt & Whitney or Hamilton Standard factory-made and warranted new parts are used.**
2. **Only factory-trained technicians touch your equipment.**
3. **Only the AIRPORT DEPARTMENT is equipped and staffed to perform all possible repair and overhaul operations.**
4. **The AIRPORT DEPARTMENT offers you the dependability of a factory-rebuilt engine.**
5. **Located at Rentschler Airport, one of the finest private airports in the country.**

Complete servicing, maintenance, and repair of aircraft and equipment including radio installation are available in our spacious service hangar equipped with the most modern facilities.

FLY IN FOR A VISIT or telephone or send for a pictorial booklet and see why you get longer and better service from your Pratt & Whitney engines and Hamilton Standard propellers when they are serviced by the Airport Department of Pratt & Whitney Aircraft, Division United Aircraft Corporation, Rentschler Airport, East Hartford, Connecticut.

Helioplane

(*Continued from page 15*)

to several unusual design features, plus automatically retractable leading edge slats, flaps and a large, high-thrust propeller.

But the public, aware of the long road between prototype and production model, has been sitting back to see what the *Helioplane* would actually do in service tests. "We expected mechanical 'bugs' in the first test model," Bollinger reports, "but in 10 months of active flying, we have had only one minor landing gear difficulty."

Both Bollinger and Koppen believe the plane will give the lightplane industry a tremendous shot in the arm.

Most of the first 100 planes will be sold to selected business users in two—possibly three—U.S. areas. Detroit will get a large number of planes with possibly Chicago and one other city receiving the remainder.

In these three general areas, the planes will be operated under Helio Corporation surveillance with factory servicemen available to handle servicing requirements.

Details of the new four-placer were not revealed but it was announced that:

● The first five planes will be produced in Boston, where the prototype is now under construction and where the plane will be certificated.

● In capacity, range, speed and price, the four-place *Helioplane* will be approximately in line with current medium-priced four-placers.

● Engine will be 145 h.p.

● Slow-speed performance will be approximately that of the two-place *Helioplane* which has been demonstrated publicly on the East Coast. Minimum speed will be 30 m.p.h. "plus or minus three m.p.h." Take-off and landing will be about the same (100 feet) although the *Four* is expected to have a "perceptibly shorter" take-off run than the two-placer. Cruising speed and range will, of course, be stepped up.

● The *Four* will have some "substantial design improvements," the result of 10 months' testing of the two-placer.

The decision to market-test 100 planes with business users was based on Bollinger and Koppen's conviction that the slow-landing plane will be especially useful to company executives in commuting between factories, landing their *Helioplanes* off regular airports.

"The plane, even if things go well, won't be available through normal distribution channels in 1950," says Bollinger. "We don't expect to make a profit on the first 100 planes. Instead, we propose to allocate them to places where they'll accomplish our main purpose—to show us the market and new uses.

"For example," he continues, "we have already surveyed 22 potential industrial users in the Detroit area. Twenty-one of those assured us they would be able to use the *Helioplane*, landing and taking off right on their own property. And that's what we're mainly interested in determining: the *off*-airport market.

"Before deliveries are made, our initial test model will have had over 18 months of rigorous flying," Bollinger states, "and the first three advance production models will be set aside for accelerated service testing. We believe the time and care taken before making sales will ultimately pay off in a record for safety and reliability."

The Helio Corporation, builders of the *Helioplane*, originally consisted of only Koppen and Bollinger plus a few friends. Several months ago, however, a group of Midwestern businessmen approached the corporation and furnished some capital backing. Control of the company remains in the hands of the two original builders of the *Helioplane*.

But even with additional capital, Bollinger and Koppen are proceeding slowly. They don't propose to distribute the plane until results of initial testing are complete. Even without hitches in the Helio Corporation's time schedule, it will be 1951 before the *Four* can be generally available. END

Schweizer 1-23

(*Continued from page 28*)

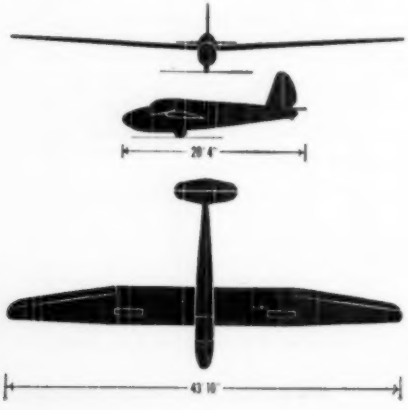
broken cumulus clouds to 6,000 feet. This gave lots of altitude for photography. I wanted a good shot in inverted flight, and so rolled it over at 5,000 feet. The 1-23 is slick inside as well as out; there are no hand holds in the cockpit. Also the safety belt was not tight enough (my fault, not the 1-23's). As a result, as soon as I was upside down I inadvertently gave the Lucite a wonderful strength check and found it to be well above CAA minimums. After porpoising a few times I pulled through in a half-loop. I can now vouch for the fact that at 145 m.p.h. the 1-23 still has good control. I do not mind hacking on aerobatics where no one can see me, but here I could just feel the photographer, Lou Mass, with his 3,000 hours of flight time, laughing at me from the towplane.

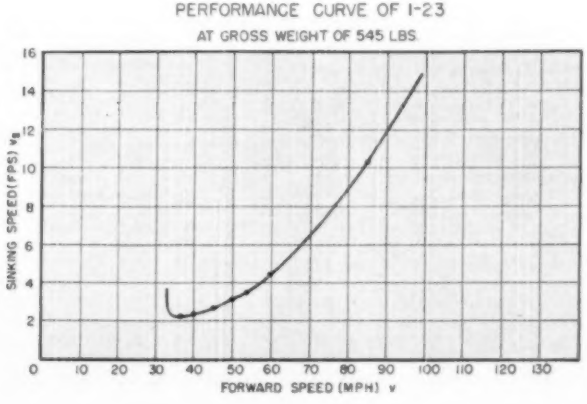
At 3,000 feet, where the thermals were, the 1-23 began soaring. In the very first thermal the low speed characteristics of the craft were easy to check. With stalling speed 33 m.p.h. indicated, 40 m.p.h. was a good speed to fly in a 30° bank. There is no harm in stalling, however, except that it momentarily increases the sinking speed. In a 45° bank, 45 m.p.h. felt proper. I was then pulling 1.4 G's and needed the greater speed.

All the controls—aileron, elevator and rudder—were light and yet gave a comfortable amount of "feel." There was even a trim tab that put spring pressure on the stick. When on full it made hands-off flight possible at speeds of about 40 m.p.h.

Maneuverability in a thermal was excellent. The 1-23 could be whipped around as easily and rapidly as the small "Screamin' Wiener," a 35-foot, 240-pound sailplane which I used to fly and which previously I had thought to be the best thermal sailplane built. Thermals are irregular and turbulent—consequently you need excellent maneuverability for continuous spiraling in the center of maximum lift.

After gaining altitude in several ther-





mals, it was time to check high speed characteristics and aerobatic potentialities. The 1-23's rolling velocity at 90 m.p.h. seemed to be just about the same as at low speeds. The controls at all speeds are so light and the 1-23's response so rapid that it is a joy to do wingovers.

Loops in a sailplane are always easy and fun; I got a clean loop starting from speeds as low as 80 m.p.h. with the Schweizer. Kim Scribner, aerobatic soaring champion, has a 1-23 with extra thick skin on the wings so that he can use it for the more violent maneuvers, including outside loops.

Sailplanes have long wings and short tails, which makes it difficult to give them sufficient directional control. I've never flown a sailplane yet that had all the rudder control I wanted, and this includes the 1-23. The 1-23 did not yield coordinated turns with maximum rolling even when full rudder was used (adverse yaw was too strong). I could not control direction in a stall with rudder, and the slow rolls and snap rolls I tried never came out properly. But these are unimportant details, not even considered in a normal flight. The 1-23 still has much better directional control than my Orlik sailplane, and is on a par with most sailplanes in this control. It is safe at all speeds, and gives lots of stall warning.

In a spin the rotation was fast, because of the short span. The 1-23 seemed perfectly at home in the continued stall; there was no feeling of "straining." The airspeed read about 30 m.p.h. in the spins, and that should be pretty nearly correct. Recovery was effected with full opposite rudder, and it was possible to stay below 60 m.p.h. during the whole pull-out. It did not seem possible to recover from a spin using the stick alone. I had to use rudder on each of the few recoveries I tried.

Spinning is a good way to lose altitude, but with the 1-23 the spoilers in the wings proved to be just as effective. At 95 m.p.h. with full spoilers, the 1-23 dropped 2,000 f.p.m. To land, you come in high and use the spoilers to dump you right where you want to sit. Pulling out the spoiler handle the maximum amount puts on the brake as well as the spoilers.

To keep the sailplane as light as possible, the Schweizers have constructed the wing so it has its ideal form only below about 1.5 G's, the region of stress in which the plane is normally flown. With higher G loads, you can watch each panel of the leading edge skin buckle, just as it is supposed to do. Despite the buckling, the tips of the wings stay rigidly in place under all conditions because the metal is so strong.

On the ground once again, I had another chance to examine the 1-23. Aluminum is used throughout: 24 ST almost everywhere, with a bit of 75 ST on portions of the wing where stresses are high. The front part of the fuselage, the cockpit, has skin about 1/16 of an inch thick, which provides extra structural strength. By putting the strength in the skin, hardly any internal structure is needed. Compared with most present-day sailplanes, the 1-23 is truly in the modern trend of "smaller on the outside, larger on the inside."

The 1-23 was preceded by the Schweizer 1-21, a large, slim-winged, all-metal sailplane with exceptional high-speed performance. The 1-21, however, was too expensive for large scale production and only two were built. The 1-23, introduced at the 1948 national soaring contest, is in regular production at the present time.

Six 1-23's have already been built, and production plans call for two per month.

The basic price of $2,195 for the standard model includes an airspeed indicator and variometer. For $245 more you can get complete flush riveting, and an additional $225 will put water ballast tanks in the wings. Adding weight to a glider may seem strange, but increasing the weight means the sailplane gets the same gliding angle at higher speeds. That is an asset while cruising between thermals on days when strong up-currents make decreased low-speed performance relatively unimportant.

For another $200, Schweizer adds a deluxe filled and rubbed two-tone lacquer finish. This filling of cracks and laps with putty improves all-around performance, particularly at higher speeds. One final alteration would be a retractable wheel with cover plates, for something over $300. As yet, no 1-23 has been produced with this modification.

The 1-23 flown for this article did not have the retractable wheel or water ballast.

Ease of landing and handling on the ground and the lack of need for much maintenance make the 1-23 ideal for sport flying. High altitude wave and thermal flights are fun, and teach you a lot, but when it comes to enjoyment nothing is better than slope soaring in a 1-23 at a site such as the cliffs at Torrey Pines, just north of San Diego. In the up-current formed when the ocean breeze meets the cliffs you can soar along with the sea gulls or silently "buzz" observers on the edge of the cliff. It is fun to surprise hikers by sneaking up on them with the glider and then shouting. Slope soaring is the only legalized form of "flat-hatting."

And if you are getting practice in flying, the slope wind provides a perfect, smooth updraft in which to practice coordination. END

ENGINEERING DEGREE IN 27 MONTHS
INDIANA TECHNICAL COLLEGE
B.S. DEGREE. Aeronautical, Chemical, Civil, Electrical, Mechanical and Radio Engineering (inc. television). Drafting 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states, 16 countries. Demand for graduates. Enjoy Junior Prom, Sept., Dec., March. Write for catalog. 521 E. Washington Blvd., Fort Wayne 2, Indiana.

You will find many Interesting Bargains in the *Classified* Columns

Imported Swiss Stop CHRONOGRAPH Aviator's Multi-Purpose WRIST WATCH $6.90
Plus 60c Fed. Tax
1 YR. WRITTEN GUARANTEE AND INSTRUCTIONS
Given Handsome Stainless Steel Expansion Band "Wonder" Watch. For timing airplanes, autos, horse races, athletic events • Tachometer • Telemeter • Hands & Nos. Glow in Dark • Unbreakable Crystal • Large Red Sweep Hand • Tells Time • Measures Speed & Distance • Stop Watch • Precision Made
SENT ON APPROVAL. Deposit $6.90 plus tax and postage with postman or send money order, save postage. (Same money back privilege.)
JEWELBOX, Dept. NR, 1074 Broadway, N. Y. 10, N. Y.

PILOTS! Which Of These Navigation Necessities Do You Need?

THE WEEMS LINE includes many navigation aids and instruments which are standard equipment with U. S. Air Force and Naval Aviation, major air lines and foreign governments. Navigation "musts" for pilot and student alike are the Weems Mark II Aircraft Plotter, and the Dalton E-6B, or Mark VII Computer. Either see your Aviation Supply Dealer, or send check direct. Prices shown below.

WEEMS MARK II PLOTTER: Scale fits sectional and world air charts. Used for plotting bearings, courses, measuring distances, constructing wind diagrams and angles. Only $2.00.

DALTON E-6B COMPUTER: Two sides. One solves all vector problems—wind, true heading, ground speed. Other side graduated for computing speed-time-distance, fuel consumption, air speed and altitude corrections, and statute-nautical mile conversions. Only $10.00, with carrying case and instructions.

DALTON MARK VII COMPUTER: Vector side "mocks up" track-drift-true heading triangle, allows simple, easily-orientated setting-up and solution of all wind problems. Computer side for speed-time-distance, fuel consumption, air speed and altitude corrections, and statute-nautical mile conversions, plus erasable air speed calibration chart and flight log. Only $5.00.

WEEMS AIR NAVIGATION SCHOOL: Established 1927. Resident and Correspondence Courses.

For free catalog describing full Weems line—Address Dept. 20, Weems System of Navigation, Annapolis, Maryland

AIR WSN WEEMS SEA SYSTEM OF NAVIGATION

Insurance

(Continued from page 30)

ber may understandably feel that his own investment should be insured against loss resulting from the acts of another member who may be less careful.

Another reason for carrying hull insurance is that limited finances may prevent repair of a damaged plane with the club's funds.

A common form of hull insurance is 10 per cent deductible. This provides that the club must pay the full amount of any loss up to 10 per cent of the value of the plane, and the insurance company pays only that proportion of a loss which exceeds 10 per cent of the value. For example, 10 per cent of a $2,000 plane is $200, and the insurance company pays only the amount of any loss which exceeds $200. Some insurance companies issue policies with a five per cent deductible, at a cost somewhat higher than the cost of a 10 per cent deductible policy. It may also be possible to get a policy providing for a participation in any loss. These "participation" policies provide that the insurance company pays a specified percentage of all losses (frequently 75 per cent) and the owner pays the remainder (the remaining 25 per cent for example).

Flying clubs with deductible policies should provide a system for payment of the amount deductible in case of a loss. Since minor losses of less than the deductible amount are not covered by the insurance, the maintenance account should carry a sufficient balance so that the plane will not be forced out of use by the club's inability to meet its share of a repair bill.

Flying clubs should consider the desirability of carrying personal accident insurance for members. Many accident insurance policies carried by individuals and many group insurance policies have restrictions regarding flying accidents. It is possible, however, to obtain special aviation accident policies which cover medical or other expenses incurred by club members as a result of flying accidents.

It is important for a flying club to see that all insurance policies are written to show the correct name of the plane owner. If the club is a corporation, the coverage should be written to protect both the corporation and the individual members. If the club is a partnership or an unincorporated association the policy ordinarily should include the names of all the individuals who are members of the club. The exact situation regarding title, ownership and use should be given to the insurance company representative so that the policy can be written to cover everyone who might be held liable for damages or who might lose if an accident occurs.

Flying club rules or by-laws should take into account the fact that all insurance policies contain exclusions. For example, hull insurance policies usually exclude loss resulting from the plane's being used for any unlawful purpose, or in violation of certain parts of the Civil Air Regulations. The club rules should make it clear that the pilot who is flying the plane shall be responsible for any loss caused by his violation of the insurance policy conditions, and for which the insurance company is not liable.

A well-managed flying club has no difficulty obtaining insurance. Insurance companies ordinarily investigate the character of members in the club, the supervision of flying activities, and the arrangements for maintenance. Most insurance companies will advise a club regarding any changes that may be necessary to make a club acceptable for insurance. END

Report from Washington

(Continued from page 32)

channels of communication with the Air Force. It is conceivable that this might deprive them of the use of Air Guard transport planes, supplied by the Federal Government, when engaged in administrative missions.

As to the fundamental question of whether divided control over the National Guard endangers national security, there are honest differences of opinion. Spokesmen for National Guard organizations say that the present system would work if national defense officials would cooperate more and criticize less. In the event of sudden enemy aggression, they insist that air guard units as well as other components of the National Guard would jump to their places on the defense team without standing on technicalities. They think it sheer nonsense to contend that National Guard reserves would be withheld until Congress could declare the existence of an emergency—though this is the law of the land.

On the score of the Air Guard, the state folks proudly proclaim that it has two-thirds of the fighter defense strength of the country, and that the bulk of the pilots are World War II veterans with plenty of actual combat experience. They further point out that the Air Guard is getting the most modern equipment. For two years it has had five F-80 squadrons and by early summer will have from 16 to 20 F-84 squadrons to add to the six or seven it now has.

The Air Guard complains of too much Air Force red tape. One story is told frequently: An Air Guard unit was penalized by the Air Force for failing to fire rockets during target practice. In assessing the penalty, Air Force officials blandly overlooked the fact that the Air Guard units involved had been trying for months to get the necessary rocket equipment from the Air Force—with no success.

Still another gripe is that state forces are supposed to operate light bomber units but are still supplied with obsolete equipment. All they have are B-26's, which more than once have been roundly denounced as "maintenance nightmares." If the Air Force isn't ready to come out with a firm program for replacing these light bombers or reassigning the crews to fighters, state officials feel that a greater effort should be made to supply parts for the present equipment.

But there is much to be said on the side of greater Federal control. Most national defense officials are inclined to shun the subject for the time being. If they were to say what is in their minds, however, they would endorse a program similar to that proposed in the now shelved Gray Board report. This report was made several years ago by a board headed by Secretary of the Army Gray when he was Assistant Secretary.

Its gist is that the U.S. must do one of two things: Either it will have to build up an active peacetime military force of a size that would completely wreck its budget or it must be able to count on the immediate availability of adequately trained reserves. Since the second alternative is the only feasible one, the National Guard organization must be shifted to Federal control. Actually, this would mean incorporating the National Guard and the Air National Guard into the organized reserve corps of the Army and Air Force.

To take care of the needs of the states in coping with civil disorder or patrolling areas hit by natural disasters such as fires and floods, it has been proposed that a separate force be organized or some of the existing guard units be retained.

At any rate, it is argued that the present National Guard organization is much larger than is needed for purely state missions. In fact it is claimed that many state governors answered in the negative when queried as to their need for a combat state air force.

Besides stressing the need for quick

BEST BUY UNDER THE SUN!
U. S. Army Air Force Type
SUN GLASSES
Men's and Women's sizes

FORMERLY $8.50 VALUE
Sensationally Priced at only ... $1.88 postpaid
★ Cool green meniscus curved, polished lenses.
★ 24 Karat Gold Plated adjustable frames
★ Pearloid Sweat-bar and Nose-pads
★ Reinforcing bar for greater durability
★ Lenses meet specification of U. S. Gov't. Bureau of Standards.
LIFETIME GUARANTEE
Included with every pair of glasses
10-DAY TRIAL • MONEY-BACK GUARANTEE
MAIL THIS COUPON TODAY!
CHICAGO GOGGLE SALES CO., Dept. 206
20 E. Delaware Pl., Chicago 11, Ill.
Please send me.... Men's.... Women's Sun Glasses.
☐ Send C.O.D.
☐ Enclosed find $..... Mail Postpaid.
Name.....
Address.....
Town..... State.....

mobilization and the difficulty of achieving it under split command, those who believe that it is essential to federalize the national guard make the charge that there is too much state politics under the present system. They do not question the fact that the great majority of the men and officers are reasonably well trained and competent but they feel that some of those on top are not all they should be.

Finally it is pointed out that if the ground forces or air units of a state want to cross state lines, they can do so only through a cumbersome process. Each governor must agree. On quite a few occasions states have objected to joint maneuvers of organic units.

Even though neither side is seeking an immediate showdown, it is increasingly apparent that with the cold war getting perceptibly warmer, the issue will have to be faced sooner or later. It goes without saying that conditions will have to take a decisive turn for the worse before Congress will even consider, let alone act on, a proposal to federalize the National Guard. END

The Mail Box

(*Continued from page 40*)

individualism built America and will continue to be the main source of progress—not political control or regimentation. . . .

GORDON B. JACKSON
Aeronautical Designer
Franklin, Pa.

Everyone in the business should rally around a central cause supporting an all-out attack on the kiss of death that lies in the O3 category. . . .

BOB ARENTZ
Salt Lake City, U.

I have never read anything more realistic and to the point than your article on CAR's Part O3. When the bonds, due to Part O3, which are now strangling the aviation business are removed . . . aviation will grow by leaps and bounds.

THOMAS H. NOONAN, President
Aviation Center, Inc.
Cincinnati, O.

I read very carefully "The Rules That Shackle Plane Improvement" and agree with Mr. Loening that "the automobile industry . . . proves . . . that 'the survival of the fittest' is the best check-up of a stress analysis."

Every automobile firm has its own testing grounds and each new model is thoroughly tested before being put on the market.

Neither the AAA nor any other association has anything to say about automobile design and production; and automobiles don't need to be certificated before they can be driven.

If this plan works with cars, why not with planes? Mr. Loening is right—it should be the 'survival of the fittest.'

TRUMAN PARKER
Marquette, Neb.

Your article on CAA regulations made quite an impression on me. . . . Maybe it's because I once owned a Culver *Cadet* and have always felt it could have been developed into a wonderful plane.

CARL E. BISHOP
Kendall, Kan.

As one of the major participants in [the Part O3] argument right now, I would like to tell just how concerned the CAA is about the "Death of Private Aviation," and how much they are trying to do to keep it from going down. . . .

With full realization that an ATC does not commit the Government to any legal or moral responsibility for someone crashing an aircraft, the CAA is showing increased concern and is making every effort to assist new developments such as ours. When I say "assist," I mean even to the point of their now having granted us permission to build and sell a limited number of *Aerocars* to the public for service test, sales promotion, and demonstration. *All without a formal ATC.* We are, of course, demonstrating our machine's strength by static tests where desirable, and we will flight-test it in a manner to demonstrate its strength and characteristics. This anyone would do and, like the automobile manufacturers you mentioned, we are doing it for our own information and satisfaction. . . . The main point right now is that the CAA *has* given at least one outfit—namely, Aerocar—permission to go out and try what you and the rest of the critics, including ourselves, say should be done in the way of introducing a new aircraft.

The real problem that is "shackling plane improvement" is lack of investment

(*Continued on next page*)

SENSATIONAL VALUE

only $59.50 including tax

TWELVE HOUR RECORDER

17 jewels, 2 pushes, 6 hands, Incabloc shock-resistant. Records up to 12 hours. Sweep second hand. Time out feature. Radium dial. Anti-magnetic. Unbreakable crystal. Handsome, extra-thin stainless steel case.

No flyer should be without one. Also ideal for physicians, engineers, radio men, etc.

It's a stopwatch, telemeter, tachometer, perfect timekeeper. Will last a lifetime. Thousands used by our armed forces. Formerly $150. Famous make, brand new.

Guaranteed! Your money back in ten days if not satisfied for any reason. Mail orders promptly filled. Shipped postpaid for check or M.O. or will send C.O.D.

Exclusive with

WHITE PLAINS WATCH CO.
RIVER PARK 176, WHITE PLAINS, N. Y.

TRI-STATE COLLEGE

B. S. DEGREE IN 27 MONTHS

Founded 1884
World-Wide Enrollment

Personalized instruction. Wind tunnel, structural, and dynamometer testing included. B. S. degree courses also in Civil, Elect., Mech., Chem., Radio and Telev. Engineering; Bus. Adm., Acct. Visit campus, see well equipped labs. Low cost. Prep. courses. Grads successful. Enter June, Sept., Jan., March. Write for Catalog. 660 College Ave., Angola, Ind.

YOUR RATINGS!

New typical examinations with each of the famous Zweng Manuals!

1. **Airline Transport Pilot:** the nation's No. 1 guide to this rating..... $4.00
2. **Instrument Rating:** Weems & Zweng, deluxe edition. 1950 supplement. 4.50
3. **Flight Instructor:** both new oral & written typical examinations..... 3.00
4. **Flight Instructor Oral Examination:** now! With many diagrams..... 1.00
5. **Ground Instructor:** new edition. Complete typical examinations..... 3.00
6. **A. & E. Mechanics:** both ratings in one concise, up-to-date manual..... 3.00
7. **Aircraft Dispatcher:** this rating leads to a top airline position 4.00
8. **Private and Commercial Pilots:** 2 ratings, 1 manual. New revised typical examinations.. $3.00
9. **Flight Engineer:** new DC-6, DC-4 and Constellation examinations. With complete text..... $4.50
10. **Flight Navigator:** the only typical examinations available for this new airline rating..... $3.00
11. **Electronic Navigation:** radar and loran so you can understand it. With study questions..... $4.50
12. **Zweng Aviation Dictionary**..... $6.00

Send me the manuals circled by number below:
1 2 3 4 5 6 7 8 9 10 11 12
☐ Payment enclosed. ☐ Send C.O.D.
☐ Send me a free copy of new 1950 catalogue.
f4
Name.....
Street.....
City & State.....

Write for free copy of new 1950 Aero Catalogue!

PAN AMERICAN NAVIGATION SERVICE
12021 VENTURA BLVD. F-4 • NORTH HOLLYWOOD, CALIF.

Chronograph Wrist Watch

LOWEST MARKET PRICE $7.25
DeLuxe Model, Formerly $9.95
Sweep Second Hand; Precision Workmanship; Rugged Shock-resistant case; Radium hands and numerals; Leather strap. It measures distance, speed of cars, planes, horses and other moving objects. It's a time keeper, stop watch, telemeter, tachometer. ONE YEAR WRITTEN GUARANTEE and full operating instructions enclosed with each watch. SEND NO MONEY. Mail your order today. Pay postman $7.25 plus 10% Federal tax. Total $8.00 plus postage. Or send cash (money order or check) with your order and save postage charge.
MARDO SALES CO., Dept. 4806
480 Lexington Ave., N. Y. 17

TIP to FLYING readers!
. . . judges in the
$25,000.00 POPULAR PHOTOGRAPHY PICTURE CONTEST
WILL BE ON A SHARP LOOKOUT FOR DRAMATIC AIR PICTURES
ENTER TODAY!
YOU could win one of the 280 AWARDS IN U.S. SAVINGS BONDS . . .
CONTEST DETAILS IN APRIL
POPULAR PHOTOGRAPHY
ON SALE NOW!

capital—a problem that faces almost everyone in the private plane industry today. We know; we have spent eight months, so far, trying to sell stock and have managed to sell only enough to keep our project alive.

There is an almost absolute lack of people who have a little money to take a gamble on something new. This means that little outfits like ourselves, and hundreds like us, are just not able to find the money it takes to bring out a new machine, even if it was the actual and final answer to the airplane problem.

"Shackled plane improvement" is not a matter of aerodynamics, or aeronautical research. It is a matter of national economics.

MOLT TAYLOR, President
Aerocar, Inc.
Longview, Wash.

● CAA is now proposing to give manufacturers of planes of less than 5,000 pounds gross weight, and carrying five or fewer persons, the option of certificating their own planes. The program would be available only to established and approved manufacturers, and would require the manufacturer to warrant that the type meets provisions of Part 03 of CAR and mandatory notes. CAA could still ground types, revoke type certificates. The only difference in the new proposal appears to be that the manufacturer would be his own policeman but would continue to follow the old rules under the still-watchful eye of the CAA. FLYING has considered possible advantages of this plan, doubts that there are any.—ED.

HELP FROM MR. HODGKIN

My interests are equally divided between civilian and military aviation, but "I Land Anywhere," [February FLYING] by John W. Hodgkin overshadowed all the other articles in interest for me.

Mr. Hodgkin has a readable, concise way of presenting facts, and his experiments with unorthodox landing equipment and procedure will probably save a lot of mountain flyers a great deal of trouble and expense. He has shown me, for one, how to get the most out of a weekend. And best of all, I learned how to avoid a long, hazardous trip by road up into the Sierras for a few days of skiing—a problem that has stumped me for some time. . . .

PERRY MINTON
Oakland, Calif.

Classified Advertising

RATE: 30c PER WORD — MINIMUM 10 WORDS

AIRPLANES FOR SALE

BELLANCA

CRUISAIRS: 17 available. 1947, #75426F, has 350 hours. Small fins. Outside baggage door. Aeromatic. Primary blind. 2 transceivers, one VHF. All bulletins. $2750. Also 1948, #75403F, $4275, and 1949, #75401F, $6000. Apply, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

BEECH

BONANZA. Write for bargains both models. Box 1709, Wilmington, Del.

BONANZAS: 47 available from $5500. A-35, #759BF, has 296 hours. Directional gyro. Chronograph clock. Accelerometer. Vacuum system. ARC VHF transceiver. Also Motorola. Clean. Relicensed. $8150. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

BONANZA A35. Serial No. 2106. Factory paint job blue and cream. Purchased new September, 1949. 127 hours. Just completed 100 hour check. 20 gallon auxiliary tank, full gyro panel, vacuum pump, suction gauge, special map case with vacuum bottle, Lear A.D.F., latest Narco Omni with special Beech panel, V.H.F. Receiver and Transmitter, I.L.S., 2-way Avigator, Marker Beacon Receiver, Electric Constant Speed Propeller. Waxed, polished and always hangared. Maintained by Beech Distributor and it's perfect. Would cost $16,340 to duplicate. Selling for personal reasons. What is your best offer? No trades please. All inquiries answered. Samuel Levitt, 1775 Broadway, New York 19, N.Y. Circle 6-4251.

BEECH Twins: 5 available from $17,500. Spartan overhauled plush long nose conversion. New P & W's, ILS, VHF, etc. Asking $19,225. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

BONANZAS: 14 available from $5,500. 1947 model 35, 162 hours, clean, $6,550 asked. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

CALL-AIR

CALL-AIR: 4 available from $1200. #34364F has 150 hours. 125 HP. Two-way radio. Extra instruments. Stall warning. Lights. $2200. Make offer. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

CULVER

HAVE Culver LC-A excellent condition throughout. Two-way RCA. Four hours since major overhaul. School-boy, must sacrifice, $750. O. B. Kiel, Jr., 300 W. 27th, Austin, Tex.

CESSNA

140'S: 73 AVAILABLE. 1946, #80460F, has 399 hours. 226 on new engine. Metal propeller. Dual brakes. Primary blind. Mixture control. Radio. All bulletins. $1200. Also 1948, similarly equipped, #2490VF, with 110 hours. $1700. Apply, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

170'S: 33 AVAILABLE. 1948, #3910VF, has 22 hours. DeLuxe equipment. Hangared. Never damaged. $3800. Also, 1949 all metal, #9320AF, with 150 hours. Fully equipped. New, $5000. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

CESSNA 170: 7 available from $3,900. 1949 model, 63 total hours, equipped with cross-wind gear, other extras. Excellent. $5975. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

SEAPLANES: Cessna 140 on Edo 1620's. Floats less than 100 hours, fresh water only. All Cessna extras. 2 McCauley Propellers. $2,500. PA-12's on Edos from $2,100. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

CESSNA 195: 2 available. 1948 model, 240 hours, $11,000 asked. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

ERCOUPE

WILL trade clean 1946 Ercoupe, (2 way Radio, Metal Prop), for 1947 or 1948 Ercoupe. Also have 1946 wrecked. Ray Lindley, Onawa, Ia.

ERCOUPES: 77 available from $850. 1946, #90627F, is painted. 137 hours. Metal propeller. Radio. All bulletins. $1000. Also, improved 1947, #95721F, with 140 hours. Metal propeller. Radio. Loop. $1300. Apply, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or 505 N. Ervay, Dallas, Tex.

GRUMMAN

WIDGEONS: 20 available from $7625. Late G-44-A. #87656F, has 233 hours. Curtiss metal propellers. Special radio. Loop. Gyros. Relicensed. Grumman maintained. Exceptional. $16,500. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

NAVION

205-HP RYAN Navion NC 4496 K. Perfect condition. Manufactured October 1948. Total time 400 hours. Completely equipped, including heater, special carpet, and full gyro instruments. Blue color. Will deliver anywhere in U.S. Make offer, no trades. B. O. Reynolds, Lake Geneva, Wis.

NAVIONS: 60 available from $4200. 1948 Ryan, #4420KF, has 115 hours. 205 HP. engine. Extras. Relicensed. Beautiful. $6300. Also, 1949 No. 4054KF with 150 hours. New. $9000. Apply, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

NORTH American Navion. Company owned. One Pilot. Full gyro panel, GE Radio, ADF, Flares, new Prop. and assembly. Other extras. Excellent cond. Albee Motors, 359 State St., Elmira, N. Y.

NAVIONS: 17 available from $4,750. Late 1948, 85 total hours, ARC, ADF, VHF, perfect. $9,000. 1949 model, 67 hours, VHF, ADF, etc. Clean. $10,250. 1947 model, 114 hours $6,700. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

LUSCOMBE

LUSCOMBES: 43 available. 1948, 8A, #206F, has 256 hours. Metal propeller. Extras. Relicensed. $1150. Also, Metal wing 8E, #1048KF, with 285 hours. Metal propeller. Primary blind. Radio. Stall warning. $1600. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

HOWARD

DGA-15-P'S: 11 AVAILABLE. #1418MF has 250 total hours. Gyros. ARC radio. Hangared. Relicensed. Excellent. Apply, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or 505 N. Ervay, Dallas, Tex.

HOWARDS: Excellent 1944 model, P&W 450, Hamilton propeller, new paint, ADF plus complete radio. Clean. $1,900. Others. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

PIPER

CLIPPERS: 3 available from $2500. #5010HF has 36 hours. Radio. Hangared. Never damaged. New. $2775. Offers considered. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

1949, PIPER Clipper, 35 hours total time, Radio, Sites, Fender, Spinner, Stall Warner. George Buck, Webster, Pa. Call Donora 43J.

REPUBLIC

SEABEES: 44 from $1900. 1948, Serial 970, #7817KF, has 22 hours. All latest improvements. New condition. Relicensed. Bargain. $2575. Apply, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or 505 N. Ervay, Dallas, Tex.

SEABEE: 23 available. Late 1946, 70 hours total. Steerable tailwheel. All bulletins up, better than new. Immaculate. $2650. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

STINSON

STINSON 1949 Flying Station Wagon. Primary Group. Like new. Less than 50 hrs. $1800, below list. F. L. Webber, 800 University Ave., St. Paul 4, Minn. Humboldt 2086.

STINSON: 65 voyagers and Station Wagons. 1947 Voyager, 67 hours, equipped, perfect. $2500. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

SWIFT

125'S: 28 from $1500. Globe, #3359KF, has 189 hour 1948 engine. Metal hatch. Aeromatic. Primary blind. Narco and GE transceivers. Landing light. Extras. Relicensed. Bargain. $1700. Also, 1949, #2479BF, with 267 hours. Aeromatic, Radio. New. Bargain. $2695. Inquire, Powers & George, Aircraft Brokers, 475 5th Ave., New York, N. Y.; or, 505 N. Ervay, Dallas, Tex.

MISCELLANEOUS

AIRPLANES. Send for free list. World's largest stock personal & light commercial. Lowest prices. Domestic & Export. We do everything except pay for your plane. Be thrifty in 1950! Dealers write for Dealer discount setup. Vest Aircraft Co., Wholesale, Field & Offices, Box 38, Capitol Hill Sta., Denver, Colo.

FLYERS! Send today for the latest issue of "Wind-Socky." The midwest's leading new and used Aircraft Publication. Bargains! Pictures! and the latest Aviation News. Published monthly! Yearly subscription $2.00 25c per copy. Box 683, Cedar Rapids, Ia.

BONANZAS; Twin Beechcrafts; Bellancas; Cessnas; Grummans; Howards; Navions; Stinsons; and Swifts, for sale. Trade-Air Service of America, 3927 Greenview Ave., Chicago 13, Ill.

AIRPLANES WANTED

WILL trade 26 ft. Steelcraft cruiser, like new, deluxe Sedan "46" model for four place aircraft. F. Gruhler, 165 W. Wyoming Ave., Philadelphia, Pa. Phone: Davenport 4-0866.

WANT small planes '47 model, up. Box 1000, Milligan, Nebr.

POWERS & George, Aircraft Brokers, of 475 Fifth Avenue, New York, N. Y.; and 505 North Ervay, Dallas, Texas, have purchasers for all types of aircraft. No charge for listing your ship for sale. Write for details, describing your airplane.

AIRCRAFT of all types are wanted for overseas and domestic buyers. Trade-Air Service of America, 3927 Greenview Ave., Chicago 13, Ill.

PROGRESSIVE aircraft brokerage will sell your airplane. No charge for listing. Write for details, describing your airplane. Madden Aircraft Brokerage, 211 N. Longview, Dayton 3, Ohio.

NAVION late Ryan. Must be bargain for cash. Give full details in first letter. M. Carmichael, 545 6th Ave., Pittsburgh 19, Pa.

PARTS & ACCESSORIES

JUST OUT! Get largest auto accessory and parts catalog in world. Over 15,000 items, including Hollywood accessories, hi-speed equipment, rebuilt engines; all parts and accessories for all cars, trucks. New, used, rebuilt! We have that hard to get part! Completely illustrated, jam-packed with bargains. Send 25c. J. C. Whitney Co., 1919-CK Archer Ave., Chicago 16, Ill.

BARGAINS in Foam Rubber. Special prices on Flat or Cored stock. We have a complete stock of U. S. Koylon Foam Rubber in stock for immediate delivery. Write for complete illustrated catalogue of Aircraft, Industrial and Rubber products. AMC Supply Co., P. O. Box 1440-F, Ft. Worth, Tex.

NEW Stearman Parts. Compare prices before buying. D & S Industries, Box 1165, York, Pa.

BARGAINS in Fairchild & Ranger parts. Write today for complete illustrated catalogue on Fairchild and Ranger parts. Fully guaranteed at prices that will save you money. AMC Supply Co., P. O. Box 1440-F, Ft. Worth, Tex.

AVIATION EQUIPMENT

F-8 AERIAL Camera new, $175.00; Astro compasses (New) $12.50; Model "G" New Computer $7.50; Fairchild (surplus) Sextant $12.50; New Taylor Barometer $9.00; New D-12 Magnetic Compass, $150.00 value, only $12.95; New improved E-6B Computer $10.00. Weems Navigation Plotter $2.00; AAF-type A-2 Computer $2.00; Air Force Computer 50c; American Airlines Computer $5.00; Weems Second Setting wrist watch $43.75; (Free catalog). Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

INSTRUMENTS. Kollsman Sensitive Altimeters, $14.95; Pioneer Rate of Climbs, $7.95; Turn and Banks, $7.95; Cylinder Head Temperatures, $7.95; Pioneer Compasses, $5.95; 0-300 Airspeeds $5.95; Directional Gyros, $29.95; Artificial Horizons, $19.95; Manifold pressures, $6.95; Suction Gauges, $2.95; Suction Regulating Valves, $1.95; Headsets, $1.65; Hand Microphones, $1.65. Payment with order. Gaare Supply, Box 1377, Vernon, Tex.

HELMETS, A-11, AAF kidskin leather with sponge rubber earcups, $3.45; ANH-15 tan cloth, sponge rubber earcups, $1.00; B2 Pilot Cap, sheepskin lined, dark brown leather, long visor, ear laps, $2.00. Send for free list. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

SPECIAL! For limited time only. Genuine Navy Intermediate Flight Jackets. New. Finest dark brown Goatskin leather. Bi-Swing back, Rayon lined, 150 count. Large Mouton fur collar, zippered front, two patch pockets, one inside snap pocket, elastic knit waistband and wristlets. Sizes 34 to 46. Only $25.00. Money back guarantee. Write for Dealer's discount. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

GENUINE Navy Intermediate Flight Jacket, dark brown goatskin, all sizes, $28.50; *Horsehide A-2 Flight Jackets, all sizes, $17.75, with fur collar, $18.75; A-2 Horsehide Jackets with two way pockets, leather collar, $18.75, fur collar, $19.75; *B-15-A Type Jackets, $9.95. Many other bargains. (Write for free catalogue, quantity discounts.) Postage prepaid when payment accompanies order. C.O.D.'s in U.S.A. only. Buy direct and save. R.A.F. Mfg. Co., 7009 N. Glenwood, Dept. FY-4, Chicago, Ill. Money Back Guarantee.

PARACHUTE Special. C.A.A. approved. Seat type. 24 ft. $29.00; 28 ft. $39.00; 10% discount on two or more. For fresh packed day of shipment add $3.00. Payment with order. Gaare Supply, Box 1377, Vernon, Tex.

E6B COMPUTER, like new, plastic $4.25 or metal $6.75 in leather holder; E6B Manual $2.50; Warner Computer-Plotter $3.00, Computer only $2.00, new. Safety Belts $1.50. Send for free list of many items. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

BATTERIES & Tires, brand new for all types aircraft. Bargains. Send for free list. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

U.S.A.F., Civil Air Patrol, Flying Clubs, Private Pilots, send for free catalog of insignia, uniforms. Federal Supply, 135-F Henry St., New York 2, N. Y.

BOOKS

FAMOUS Aviation Quiz Books by "Zweng" prepare you for your ratings. These outstanding texts lead the field; frequent revisions protect you, and the latest authentic "multiple choice and map Examinations" are included, with important new material not available elsewhere, in each book without charge. Why take a chance—ask for Zweng Aviation Books, there is one for each rating viz.: Flight Instructor $3.00; Aeronautical Training (Commercial and Private rating) $3.00; Radio & Instrument Flying $4.00; Instrument Flying (Weems & Zweng) DeLuxe $4.50; Airline Transport Pilot $4.00; Aircraft Dispatcher $4.00; Flight Engineer $4.00; Link Instructor Rating $4.00; Parachute Technician Rating $3.00; Meteorology for Airmen $3.00; Practical Manual of the E-6B, $2.50; Private Pilot Examination $1.00; New Civil Air Regulations Manual $1.00; Aircraft and Engine Mechanic including Hydraulics weight & balance, two books in one $3.00; Airport Operation and Management $4.50; Zweng Aviation Dictionary $6.00; "Flight Instructor Oral Examination" (new) prepares for the difficult "oral" test, $1.00; Leading Airline Executives and Pilots owe their success to early training with Zweng texts. (Free Catalog) Pan American Navigation Service 12021-8 Ventura Blvd., N. Hollywood, Calif.

NAVIGATOR Rating Examinations included in New Aeronautical Navigation by Charles A. Zweng $3.00; Fairchild Surplus (electrical averager) Sextant $15.00. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

GUARANTEED: Ross Guaranteed Questionnaires are available for all C.A.A. ratings. They carry a full money back guarantee if you fail to pass your exams. Ross Questionnaires have been used by thousands of Pilots, Mechanics and Instructors with success. The frequent revisions insure your obtaining the very latest material. With a Ross Guaranteed Questionnaire you save time, effort, and money. Order direct or from your nearest Dealer. "Engine Mechanic $3.00"; "Aircraft Mechanic $3.00"; Both for $5.00; "Commercial Pilot $4.00"; "Flight Instructor $4.00"; "Instrument Rating $4.00"; "Meteorology Instructor $2.50"; "Navigation Instructor $2.50"; "Aircraft Instructor $2.50"; "Engine Instructor $2.50"; "C.A.R. Instructor $2.50"; "Fundamentals of Instruction $1.00"; "As a Special offer the complete set of the above Questionnaires are priced at only $15.00". Ross Guaranteed Questionnaires are the only books available that include the same Navigation and/or Weather maps that are used by C.A.A. on their exams. Free Folder on request. Orders sent Postpaid or C.O.D. Ross Aero Publishers, Dept. 1-F, Administration Bldg., Commercial Airport, Tulsa Okla.

WING Tips for Cross-Country Flying. The new book, in non-technical language, explaining the little things that make cross-country navigation easy and safe, such as checking landmarks, weather, and special problems encountered in various parts of the country. Written by a pilot for pilots. $1.00 cash or C.O.D. plus charges. Money back guarantee. Hangar Flying, Dept. 1N4, 112 E. Grove, Bloomington, Ill. Clip this.

FLYING. Amazing new book "How To Fly" gives you everything you need to know. Navigation, Engines, Airodynamics, etc., all clearly explained. Also, questions and answers patterned after government tests, prepares you for pilots examinations. Only $3.00, postpaid. Money back guarantee. Order now! Duell, Sloan, Dept. FL-16, 270 Madison Ave., New York 16, N. Y.

STUDENTS, Mechanics, Flight Engineers: AMQ (Aero Mechanics' Questionnaire) by Ralph Rice is again available in a greatly enlarged and completely revised edition. 2300 multiple-choice questions with answers and explanatory notes covering all phases of Aircraft and Engine Mechanics including Power Plants, Carburetion, Lubrication, Propellers, Electricity, Woodwork, Dope and Fabric, Sheet Metal, Welding, Rigging (including solved weight and balance problems), Hydraulics and Civil Air Regulations based on current issues. $3.98, postpaid, or C.O.D. plus postage. Address: Paxon Publications, Box 479, Lawrence, Kan.

SOARING. Sport flying at its best. Learn what it offers you! Send $1.00 for the booklet "Soaring in America" and two copies of "Soaring," the magazine of motorless flight. Act today! Soaring Society of America, Weston, Mass.

INSTRUCTION

PILOTS, supplement your training. Order "Ground Instructor" $3.00 and "Ground Instructors' Rating" $3.00 or both for $5.00; Examinations included. These books by "Zweng" prepare you for increased earning power. Pan American Navigation Service, 12021-8 Ventura Blvd. N. Hollywood, Calif.

CONTROL Aerial Traffic. Become an Air Traffic Tower Operator. Many opportunities exist. Remit $1.00 for instructions, qualifications, sample study. Celestron Services, Box 113F, Elmont, N. Y.

YOU can design your own dream airplane. New simplified Home Study Course. Free details. Airplane Design Corp., Dept. F, Box 972, Seattle 11, Wash.

AIR Force needs officers, technicians, pilots. Train with pay. Good civilian opportunities upon completion of Air Force duties. Prepare at home for entrance examinations. Home-study instructions with Practice Examinations, $3.25. Cramwell Publications, Air Institute, Adams, Mass.

VETERANS: Be a pilot. Tuition paid under the G. I. Bill. Private, Commercial, Flight Instructor, Instrument, and Multi-engine Courses. Opportunities for part-time employment while studying. Ideal flying conditions. Write for information. Gottschalk School of Aeronautics, Adrian, Mich.

BUILD, Fly-Bullet Raceplane. Past, low-winged Lightplane. Blueprints, $2.00. Corbcraft, 80 Maxwell, Rochester 11, N. Y.

BUILD your own "Spin-Proof" Airplane. The newest "Flying-Flea," blueprints, $4.50. Wm. Venema, 142 Haledon Ave., Paterson, N. J.

SITUATIONS WANTED

COMMERCIAL 1200 hrs. SEL. & SES. Instructor. Wide Float and Ski experience. Ground Instructor. A&E License 2½ years experience. Much prefer Mountain flying. Age 25. Married. Want steady year round work. Lewis Fairfield 2nd, Schroon Lake, N. Y.

LICENSED Link & Navigation Instructor. A.N.T.-18, C-8, & G-1 (Dead Reckoning) Type Trainers'. Desires position anywhere in U.S.A. P. A. Pliska, 350 Maplewood Ave., Ambridge, Pa.

EXECUTIVE Pilot, Holland Dutch immigrant, 35, single. 6500 hrs. ICAO Airline Transport license, excellent references, 4 languages. Specialized in PBY5a, Grumman Mallard, DC3 and long range flying. Claringbould, 2707 Ferndale Pl., Houston, Tex.

HELP WANTED

AIRCRAFT Manufacturers and Airlines Reference Lists. 25 cents copy. D. E. Drum, Box 502, Stroudsburg, Pa.

"142,000 AVIATION Jobs" official forecast! Now, for immediate opportunities, we will rush you: Confidential reports covering over 75 aviation job-openings (domestic, foreign) listed by employment agencies, manufacturers, airlines. Salaries! Qualifications! Where to apply! $1.25. Lists of companies to contact for high-paying jobs: 159 Airlines (including Alaskan, South American, Foreign, Non-scheduled); 82 Aircraft and accessory manufacturers. $1.25. 6,000 word Survey of Airline Employment, revealing many little-known opportunities for men, women, skilled, unskilled. $1.25. Limited time offer, all 3 for $2.00. Includes Free! "Foreign Opportunities Report." Christopher Publications, Dept. CG-4, Holtsville, N.Y.

INTERESTED in Latin American and Foreign Employment? $1.00 brings 1950 copyrighted "Foreign Service Directory" with new complete listings in U.S. & Canadian Construction Companies; Worldwide Oil Firms, Mining, Aviation, Steamship, Transportation; Manufacturers; Importers & Exporters; Domestic & Foreign Listings. Special daily listing of firms hiring. Tells How-When-Where to apply, application form. Global Reports, P.O. Box 883-F, Hollywood 28, Calif.

OVERSEAS & U.S. Jobs for Construction Men. $1.00 brings News Bulletin, listing projects starting, contractors & locale. Global Reports, P.O. Box 883-FX, Hollywood 28, Calif.

GOOD paying jobs now open. Pilots, A. & E. Mechanics, Flight and Ground Personnel, Factory Workers, Construction, etc. We'll rush confidential reports on who to contact for best opportunities at home and abroad. Includes best available Domestic, South American, Alaskan and Foreign reports and one year registration and advisory service. Crop Dusting opportunities included on request. All for only $2.00. Rush Air Mail letter for latest reports or Telegraph your name and address and we'll send C.O.D. Why take a chance? We are the only organization that gives 30 day guarantee of satisfaction or money back. (Note to Employers: Contact us for free use of our large registration of skilled and unskilled personnel of all types. Many employers use this service to obtain all of their personnel.) We get results. Research Services, International Bldg., St. Louis 1, Mo.

PILOTS. We can help you find the right job. Send for our application blank. No registration fee. Pilots Employment Agency, Box 152F-4, Whippany, N. J.

ALASKA. The Great American Frontier, offers unlimited opportunities. $1.00 brings 1950 Copyrighted Report & Government Map. Business Directory listing Big Construction Projects; Fishing; Mining; Aviation; Hunting-Fishing-Game rules, Fur-Farming, Lumber; Agriculture; Live Stock Raising; Transportation; Homestead & Highway information. Hot list of firms hiring. Alaska Opportunist, P.O. Box 883-F, Hollywood 28, Calif.

BUSINESS OPPORTUNITIES

HOW to start your own business in Aviation with little or no capital! New, 15,000 word handbook "Profitable Opportunities in Small Aviation Business" tells you how and where! Partial contents: 21 ways to make money with a light plane! 16 on-the-ground "shoestring" opportunities (capital $100 up)! 18 part-time ventures! 10 mail-order enterprises. Many new, little-known opportunities. $2.00 postpaid. For prompt reply, free report "Guide to Successful Airport Operation." Christopher Publications, Dept. CP-4, Holtsville, N. Y.

SMALL Airport, beautiful Adirondack Lake region. Only active field in 50,000 Pop. Box 655, c/o Flying.

A PILOTS Guest Ranch. One of Washington State's ideal Guest Ranches is now for sale. It is located on the east side of the Cascade Mountains, in a little timbered basin, at the head of the Wenas Valley, which is thirty miles from Yakima and twenty miles from Ellensburg. The area is a sportsman's paradise and is noted for its climate. The ranch contains 2085 acres, 400 of which are under cultivation. A C.A.A. approved Airport is located on the property and is used extensively by guests. Altitude 2350 ft. Runway 2700 ft. Complete equipment for cattle, hay, and grain operations go with the sale. We have modernized facilities to handle thirty guests comfortably or fifty during hunting seasons or on special occasions. Price $97,000. Cash or terms. Full details without cost or obligation. Warnick Bros., owners, Route 1, Selah, Wash. Phone Selah 33F2.

PATENTS

INVENTORS. When you are satisfied that you have invented something of value, write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers (formerly Randolph & Beavers), Registered Patent Attorney, 912 Columbian Bldg., Washington 1, D. C.

INVENTORS. Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 218 Columbian Bldg., Washington 1, D. C.

MISCELLANEOUS

AIRCRAFT Photographs. Sample photo and illustrated 52-page catalog listing nearly 5000 aircraft from World War I and II, 25c. Aeroplane Photo Supply, Box 195, Toronto, Canada.

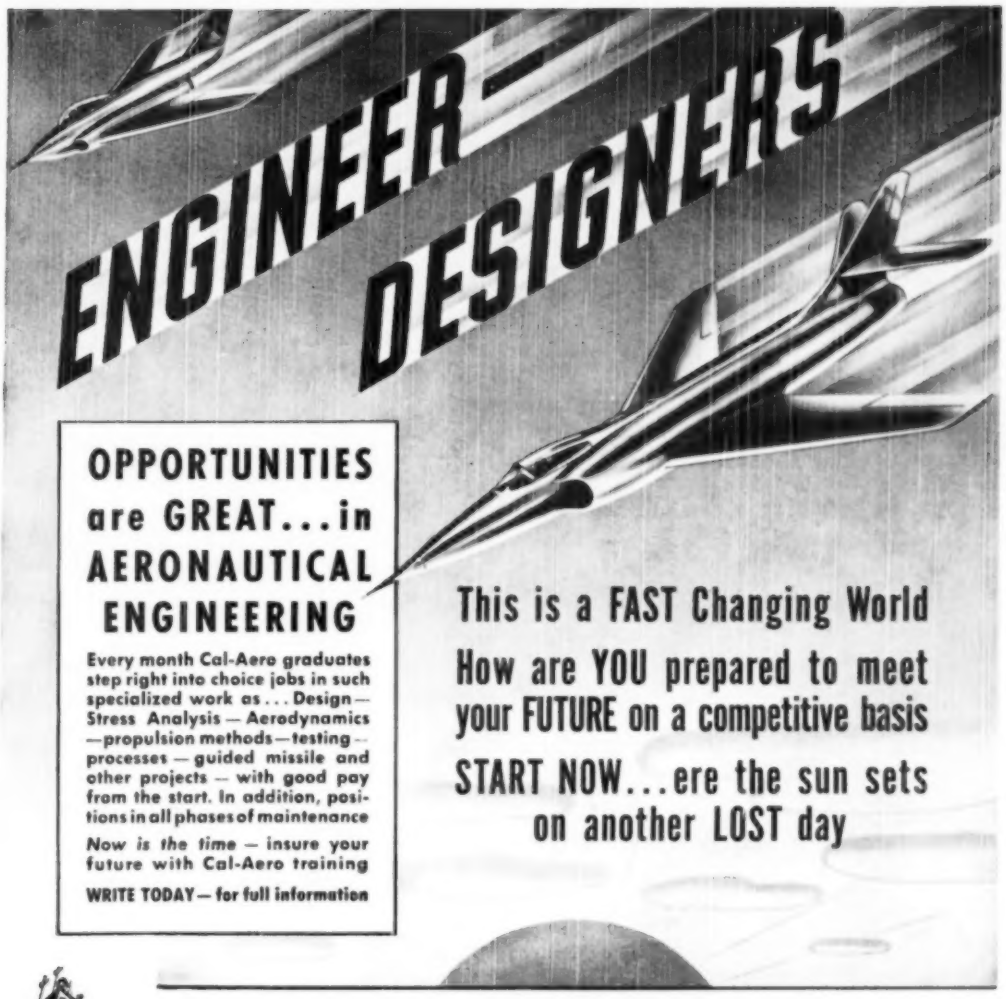
INSTRUMENT type Link Trainers for private or Flying School use. Also parts. J. A. Pugh, War Surplus Sales, Grand Bend, Ontario, Canada.

EXCLUSIVE: Three photos and specifications of the "Stits Junior," Worlds Smallest Airplane. $2.00. P. O. Box 222, Battle Creek, Mich.

YOUR Leather Jacket renovated by our craftsmen expertly, reasonably. Request Free Descriptive circular. Berlew Mfg. Co., Dept. 2, Freeport, N. Y.

MEN! Large size shoes, large size sox! We specialize in large sizes 10 to 16, widths AAA-EEE. Dress, sport, work shoes. Guaranteed. Write for free catalog. King-Size, 311, Brockton, Mass.

PRINTED IN U.S.A.



OPPORTUNITIES are GREAT... in AERONAUTICAL ENGINEERING

Every month Cal-Aero graduates step right into choice jobs in such specialized work as... Design—Stress Analysis—Aerodynamics—propulsion methods—testing—processes—guided missile and other projects—with good pay from the start. In addition, positions in all phases of maintenance

Now is the time—insure your future with Cal-Aero training

WRITE TODAY—for full information

This is a FAST Changing World

How are YOU prepared to meet your FUTURE on a competitive basis

START NOW...ere the sun sets on another LOST day

BE WISE: PROTECT YOUR FUTURE

TRAIN IN SUNNY SOUTHERN CALIFORNIA

EST. 1929

CAL-AERO TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL

GLENDALE 1, Los Angeles County, CALIFORNIA

APPROVED FOR VETERANS

DON'T DELAY - MAIL TODAY

CAL-AERO TECHNICAL INSTITUTE, Grand Central Air Terminal, Glendale 1, Calif. • Send full information and catalog, free and without obligation on courses checked below.

CAREER COURSES

☐ AERONAUTICAL ENGINEERING

☐ MASTER AVIATION MECHANICS

HOME STUDY COURSES

☐ AERONAUTICAL DRAFTING ☐ AIRCRAFT BLUEPRINT READING ☐ STRESS ANALYSIS AND DESIGN

NAME

ADDRESS

AGE

CITY ZONE STATE

HIGH SCHOOL ATTENDED GRADUATED, YES ☐ NO ☐

Check one: ☐ Veteran ☐ Non-Veteran

F-4

Check How Easy and Safe it is to Fly the NEW 1950 NAVION DE LUXE 205!

Spinner available as extra equipment

HERE'S THE NEWEST member of a distinguished family. It's a big, rugged, still better *Navion* . . . unsurpassed for safe, easy flying. That's why it's the *only* plane in its class used by the U.S. Army Field Forces . . . why it's preferred by non-professionals everywhere who fly for fun and profit. The 155 mph all-metal *Navion* offers you most of what you *want most:* restful, relaxed flying in a beautifully appointed, roomy cabin that's sound-proofed, ventilated and well-equipped. *Navion* gives you superior stability under *all* flight conditions. It forgives pilot error short of deliberate foolhardiness. *Big. Fast. Rugged. Safe and easy-to-fly.* That's *Navion*, the *dependable* airplane.

THERE'S A NAVION FOR EVERYONE IN 1950

〈 NAVION UTILITY 205

A new, hardworking plane for all who need modern, safe air transportation at minimum cost. Ideal for heavy-duty chores. Retains all safe, easy-flying features.

〈〈 NAVION DE LUXE 205

New adjustable cowl flaps give improved engine cooling; new cylinder head temperature gauge; new radio antenna; improved ventilation. Three beautiful new colors.

〈〈〈 NAVION SUPER 260

The 260 hp Lycoming model gives top all around performance, cruises at 170 mph, climbs 1250 fpm, and combines famous *Navion* rugged stability and safe flying.

1950 NAVION PRICES BEGIN AT $9485

Write today on business letterhead for more information

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

RYAN AERONAUTICAL COMPANY, 104 LINDBERGH FIELD, SAN DIEGO 12, CALIF.

✓ Check these *Navion* Features for Safer, Easier Flying!

- ✓ **SUPERIOR STABILITY** for easiest air ride under all flight conditions.
- ✓ **SHORT FIELD EXCELLENCE** with slower landings, quicker take-offs, faster climb.
- ✓ **UNEQUALLED VISIBILITY**. . . all around, over the nose and *directly back.*
- ✓ **USE ROUGH FIELDS** with confidence, even in cross winds, on mud or snow.
- ✓ **EXTRA LARGE NOSEWHEEL** that's steerable; higher ground clearance, sturdier landing gear.
- ✓ **STALL-RESISTANT, ANTI-SPIN.** Unique wing design gives aileron control *below* stalling speed.
- ✓ **RUGGED CONSTRUCTION** throughout. *Navion* was designed *from the start* for heavy-duty flying.
- ✓ **EFFICIENT HIGH-LIFT FLAPS** with selective positioning, lower a full 43°, give 63% more lift for landings under 50 mph with average loads.
- ✓ **ALL-METAL DURABILITY.** Wrinkle and dent-resistant skin.
- ✓ **AIRLINER-TYPE FUEL SYSTEM** with dual pumps.
- ✓ **EXCLUSIVE TWO-CONTROL** feature for smooth, effortless, coordinated control.